



VOL. 44, No. 12

DECEMBER 1976

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COVER PHOTO

EMDRC junior member Frank Walsh operating portable station set up in the foyer of the Nunawading Library. See article on page 8.

(Photograph by Bill Rose)

HAM

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amateur radio

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QSP LET'S LOOK AT THE YEAR

In 1976

The WIA was invited to join the Australian Planning Group for WARC 79 and has been represented at all meetings held so far.

The IARU held the first ever inter-regional conference in its history. Much forward planning was done at this conference on the Amateur Services stance for WARC 79.

This conference, being well aware of the problems of the small society, or country with no society at all, initiated the preparation of material for our "Amateur Radio World Wide Position Paper" for their assistance.

The WIA appointed a Federal Education Co-ordinator as it was felt there was a distinct need to widen our horizon in this area.

The WIA made numerous suggestions to the authorities with regard to examinations, and at present the Education Co-ordinator is discussing these with the examination section of the RFMB.

The reaction to the Arnold Report gave the impression that most divisions are satisfied with the present organisational system. However during my trip to Queensland which extended as far as Townsville it was apparent that the members who live well away from their divisional H.Q. have different requirements from those who live in the capital city.

Taking these matters and many others mentioned throughout the year in WIANEWS it is easy to see that 1977 will be another very busy year for the executive, with many very critical matters under negotiation.

I would like to take this opportunity of wishing you all the Season's Greetings on behalf of the executive and Executive Office.

DAVID WARDLAW

EDITOR'S DESK

Bill Roper, VK3ARZ

This being the final issue for 1976 the Editors and members of the Publications Committee wish to take this opportunity to wish you all a Very Merry Christmas and Prosperous New Year.

Because of holiday closures in the printing works, January AR will be delivered immediately before Christmas and should be in the mail before the New Year. The closure also affect February AR which should go out early in the second week of February.

QSP

11th AUSTRALIAN SCOUT JAMBOREE

The 11th Australian Scout Jamboree will take place at Rosemeys Park, Dandenong from Dec. 29th to Jan. 7th. VK3BSA, the official station of the Jamboree will be operating 24 hours a day for the duration of the Jamboree.

Primary frequencies will be 3.590, 7.090, 14.290, 21.360 and 28.990 MHz.

PUBLICITY

"Very early after taking office, I learned that many members expect their Director to solve all of 'their' problems. An example of this is the problem of bad publicity sometimes received from Citizens Band (which appears in the press under the name of "ham radio"). We all carry such bad publicity and want to do something about it. The League has written hundreds of letters to newspapers about the country telling them the difference between CB and Amateur Radio. Directors write letters. Club and other amateur groups do the same but with seemingly little effect. . . somewhere many newsmen cannot seem to get the difference between CB and Amateur Radio in mind, at least over a long period of time". "Doc" Gmelin, W6ZIT, the ARRL Pacific Division Director writing in Worldradio News, July 1976. He went on to say "sometimes, even when something is printed, it does little good if no one will read it".

TRANSCIVERS FOR MINES

A report in the S. African Digest of 1-10-76 shows that special low-frequency radio transceivers have been developed for use in gold mines and are to be mass produced early in 1977. The transceivers

provide underground communication with a range of about 300 Mx through solid rock, but base stations could increase this by a further 1000 Mx.

READABILITY FIVE?

Contributors of "Letters to the Editor" and some of the other features in AR, would make the Editor's task a little easier if material that is hand written is done so in a legible manner.

Material submitted for publication should (where possible) be type written, double spaced and on one side of the paper only. Thank you VK3UV.

AR POSTINGS

Very strange or perhaps not so strange in Mr. Murphy's law book. This business of getting AR out on time. No matter what care is taken all along the line something unforeseen fouls up the system more often than not. If a delay of a day or two occurs mid-month it seems reasonable that this will become magnified into four or five days by mailing time. A holiday of weekend intervenes at a critical point to cause that additional delay. On the other hand one would believe that a day or two might not matter so much near the end of the production cycle. Not so. This stretches into maybe 5 or 6 days because perhaps the mailing schedule had scheduled AR for a particular day but because of the delay other mailing had to be programmed instead and AR thereafter slotted in 'as and when'. The production of a monthly journal is in the hands of many people all working together to meet a deadline. Unfortunately all of these people (and companies) are also busy with other work, so if AR is late arriving from one link in the chain the delay tends to snowball by reason of throwing other schedules out of gear. Everything possible is done to keep AR production on time, especially is this important to those who live far from Melbourne and suffer the inevitable additional transit delays.

SATELLITE SEARCH AND RESCUE

The Telecommunications Journal Aug. '76 carries a report that the Canadian authorities have successfully demonstrated the feasibility of a new satellite-aided search and rescue concept that could reduce the time fuel and other costs associated with conventional methods of finding downed aircraft. Experiments were employed using Oscar 6 and simulated distress signals showed that a relatively low-cost, low altitude polar orbiting satellite could pinpoint crash sites in Canada and elsewhere in the world to within 8 km in as little as 15 to 20 minutes when the spacecraft first "hears" the signal put out by an ELT operating on 121.5 MHz.

AN UNWANTED EXPORT

It is noted in HR Report that FCC agents and US marshals arrested some dozen outlaw operators.

(Continued on page 5)

WIANEWS

CITIZENS BAND

One of the main topics of discussion in recent months has been CB.

Already reported in WIANEWS Nov. AR the Executive listened to what a group of CBers had to say about legalisation of this service in Australia. The background information from this meeting is likely to be useful when the Government calls for comments on this question in the near future — maybe before the end of this year.

Meanwhile the media are enjoying themselves with CB and almost everyone is getting into the act. If the 'man in the street' reads the material served up to him he would be really naive to believe all of it.

There is no reason at all why amateur radio should be linked with CB. Unfortunately few journalists can resist the temptation to refer to our service, oftentimes in derogatory terms and occasionally in the most offensive manner. Many writers on the subject display their ignorance by incorrect references even to the proper licensing and controlling authority for radio frequency spectrum management.

It seems that in Australia we are not alone in suffering from media falsehoods and deceptions. Those who listened to the Federal tape broadcast on 3rd October will have noted the problems experienced in the U.S.A. on bad publicity appearing in the press under the guise of "ham radio". Doc Gmelin, W6ZRL, the Pacific Director of ARRL had a lot to say about this in a recent issue of Worldradio News. He denounced the fact that it was almost impossible to get the true picture of amateur radio across to the media. His article went on to comment that respect is not bestowed, it is earned, and respect for Amateur Radio comes from the good things we do for the public. Often the radio amateur does not do nearly enough to get attention from the masses, he thinks; even if, by some great good fortune, something good does get into the Press it has little benefit if no-one will read it.

An article in a recent issue of a U.S.A. business magazine carried the news that the CB channels had been increased from 23 to 40 in an attempt to relieve the overcrowding in urban areas. Coupled with this, the article pointed out, was the tightening of equipment specifications to reduce interference to other electronic apparatus, including TV sets, and that the F.C.C. themselves would in future undertake their own testing of CB gear instead of relying on manufacturers' claims.

The announcement by our Minister for P & T that strict standards will be laid down in Australia for CB equipment if citizens band radio is legalised appeared in the press as a warning to purchasers if dumping occurs as the result of the stricter controls in the U.S.A.

The WIA has under consideration a policy not to support any amateur service licence below that of the Novice grade. This has been suggested in several quarters as an alternative to CB or as a transitional stage between CB and Novice. Quite apart from international regulatory obligations there are a number of very cogent reasons why such a permit or licence could create fresh areas of difficulty and complexity. The decision will rest with the Federal Council.

Any member having thoughts about the ACADEMIC concept of CB in Australia would be wise to convey them to his Divisional Council. The Institute will have an opportunity to comment to Government when the question is thrown open for public debate. The attention of the Minister has already been drawn by the Institute to certain fundamentals which can be deduced, as likely to affect the amateur service, but actual detailed comments can only await the precise nature of the proposals if the political decision to introduce CB takes the next step.

Members are fortunate in possessing an Executive responsive to the changing circumstances surrounding radio communications as a whole and which is quick on behalf of the amateur service to take advantage at the right moment in time of the constant changes going on around us.

EXAMS

The Federal Education Officer held useful discussions with the head of the examinations section of the R.F.M.D. during October. It is understood that the marking of Novice examination papers will henceforward take place in State Offices and that the issue of a syllabus for this examination will be expedited by the Institute preparing one for the section to edit and amend. Consequently Mr. Scott promised to submit a suitable syllabus by the end of November.

Discussions on multi-choice type of questions for all amateur exams were carried one stage further and it is possible that future Regulations exam papers might well include a number of multi-choice questions plus a few essay type questions so as to preserve flexibility.

Pressure was exerted in relation to the need for a greater number of examination centres and the desirability of some thought being given to the invigilation of exams by responsible amateurs. Once again the response was unfavourable in the same way that the response was unfavourable to the increased frequency of examinations.

The submission that Novice exam Morse speeds be altered to faster characters with larger pauses in between was again rejected. The RFMD follows the procedure laid down by ITU in the International Telegraph Regulations and any departure from these principles is regarded as likely to introduce unnecessary complexities particularly in the light of the proposed introduction of centrally prepared tapes by up to date mechanical methods.

The principle of conceded Novice level passes in the AOCPP theory exam — namely that those candidates obtaining some percentage below the 70% pass mark should automatically qualify for a pass at Novice level — was previously considered. However, a similar principle applied to the AOCPP Morse exam was received with considerable reservation.

It was apparent from the discussions that RFMD is conscious of the international reaction to changes in examination standards as affecting reciprocity. Any measures which would result in any loss of their direct control over examinations were viewed most unfavourably. This principle also acts in reverse. This results in Australia not recognising many overseas, and even academic, amateur licensing qualifications as acceptable either in relation to the syllabus studied or the nature and methods of conducting the examinations.

The thought that some suitable Australia-wide educational institution should conduct examinations on behalf of the licensing authority — as, for example, the London City & Guilds Institute for U.K. examinations — remained merely as a thought.

One meeting of the Executive was held during October at which reports from the various Committees were received and debated.

REPEATERS

One of the most intractable of problems is the condition that Radio Inspectors should be able to switch off any repeater in their areas at short notice if the need arises. This is still under discussion.

There arose a proposal that the time seemed ripe for holding another all-States repeater meeting similar to the last one in Wodonga some years ago. It was considered however that the expense involved in holding such a meeting appeared unnecessary when, in reality, the bulk of the difficulties related to adjacent areas in VK2 and VK3 in particular. A joint meeting between the State repeater committees immediately affected appeared more suitable.

A case for additional repeater channels on 2m (see WIANEWS Nov. AR) was believed to be imminently ready for submission. Arising out of this, when it comes to hand, will be the number and extent of active FM net frequencies. Details of the latter would be appreciated by the Federal Repeater Subcommittee.

In connection with net frequencies an interesting development relates to the exchange of digital information with the aid of microprocessors now becoming more available for amateur use. Another topic discussed was the possible establishment of a repeater for RTTY.

The VHFAC bent their minds once again to the problems of TV channels O and 5A. This was reported by the Executive in AR for June 1975 page 31 paragraph 34. The difficulties centre round the 'long distance' reception of a channel O station in an area designated for a Ch. 5A translator. The 1976 ABCB report on this question may assist in providing additional material for consideration.

Feedback from Divisions concerning beacons and beacon planning had been negligible. This had retarded progress in this field. Since 'beacons' had been allocated to the VHFAC it was agreed as sensible that this committee would also undertake any planning work needed for 10m band beacons even though this was outside the VHF area.

PENSIONERS

A letter received during October from the Secretary of the P & T Dept. advised that the Minister had indicated his agreement to the reduction of licence fees from \$12 to \$2 for amateur radio operators in receipt of a pension under the Social Services Act subject however to the restriction of the concession to those persons whose pensions were granted subject to the standard means test provisions.

This entails an amendment to the Wireless Telegraphy Regulations which might cause some delay before the proposed concession becomes effective. Readers of WIANEWS will be

aware of the efforts made by the Institute on this question over a long period of time. Letter RB4/4/32 of 19-10-1976 refers.

WICEN

The WICEN organisations of the Federal, ACT, Victorian, W. Australian, Nth. Queensland and some individuals joined together in the Natural Disasters Organisations' annual exercise "BACKUP" on 27th/28th October. Two concurrent disaster situations were simulated, bushfires in VK3 and a cyclone in VK6. Various Federal Departments, State Emergency Services, police, service personnel and others joined in the exercise at very short notice for many.

The Federal WICEN Co-ordinator, Brig. Rex Roseblade VK1QJ, wrote that the exercise was very successful. Aside from demonstrating to NDO the usefulness of WICEN for the second year in succession, some valuable publicity was obtained for amateur radio and a number of lessons were learned from it. A letter of thanks for assistance by all concerned was received by the Federal President from Major-General Alan Stretton.

The call sign VK1WI was used in Canberra and the 'provisional' WICEN frequencies on the three HF bands were activated with stations identifying messages with the words "WICEN Exercise Station". Exercise traffic was relayed by VHF link to the home QTH of VK1QJ.

QSP—continued

during a raid in northern New Jersey on premises of those engaged in illicit 27 and 28 MHz operation. The report goes on to say that a photo of the seized equipment looks like the transceiver/amplifier counter at any well equipped radio store.

And, in hearing "CB radio users jam airways, tune in trouble!" the Ottawa Citizen details the problems with the General Radio Service, as it is known in Canada. Department of Communications officials are quoted as saying that closing the entire band might be the only solution if things continue the way they are going. The editorial continues: "Originally designed for urgent general purpose conversations, the system has become, in the words of a department official 'a refuse pile for the dregs of the radio community whose main interest is in hearing themselves talk.' Strong sentiments but they reflect a growing mood among government, radio enthusiasts and the public. — From Radio Com, Oct. '76.

CB — U.S.A.

The writer of "Zero Bias" in July 1976 CQ has much to write about CB and the continuing general hostility by radio amateurs. "Amateur radio", he writes "has a lot to offer on its own but at the expense of CB. If we take as fact that CBers like its convenience, buy equipment, put up antennas, engage in public service, seek out awards and QSL cards and intellectually disregard the ethics of legality of the situation, we can see the possibility of presenting an augmentation to their by better than replacement. Most we have to offer and how we offer it may or may not be better; this is debatable from where you stand. What is true is that what we offer is different and unique. If you knock what somebody has or believes just to improve your own position you are in fact calling him a fool. Why should he continue to listen to you?"

EARTHQUAKE EMERGENCY

A resident radio amateur in the earthquake devastation of N.E. Italy early in May alerted and carried traffic on the first night of the catastrophe when no other radio communication services were operative. They used three repeaters which were still operational as well as an 80m emergency net. A mobile repeater was used later on. Their efforts were rewarded in a public speech by the General Director of the Italian P. & T. Department in Rome. A detailed report about this emergency appeared in IARU Region 1 News of Sept. '75.

NAVIGATION PROBLEMS

For small craft enthusiasts the following edited extract from an article in Worldradio News of July 1975 may be informative. It was written by an amateur working as Radio Officer aboard both tankers and freighters. "Many yachts and other small craft often misunderstand and underestimate

the manoeuvrability of large ships. A tanker drawing 30 feet or more is often restricted to a channel and cannot turn without going aground. Small craft are very difficult to see at sea. A white hull and white sails are easily lost in the white caps of even the slightest sea. If a moderate-to-heavy sea is running, it is almost impossible to see a yacht. Remember, you can probably see us for miles due to our size and colour, but don't expect us to see you. Most wooden and fibreglass hulls provide a very poor radar target so make sure you have a good radar reflector installed on top of your mast so that you can be seen. Another factor to take into consideration is the visibility from the bridge of a large tanker. There is a distance of close to 700 feet (say, 220 metres) between the bow and the bridge, and if you approach too close to the bow or cut across her bow you are very easily lost to sight. This can be a very dangerous situation for a small craft."

THOSE WERE THE DAYS

Vince Kerr VK4LK has kindly forwarded a copy of "WIRELESS A Handbook of Information for Radio Enthusiasts" circa 1950. It contains over 100 pages of the (then) most up to date theory and practice. Also included are 8 most interesting pages listing Australian telephony stations. These included A and B class stations plus dealers stations as well as the Experimenters (amateurs). Quite a few of the operators listed are still active; Harold Hobler VK4DO and Max Howden VK3BQ to name just two.

Other callings that were listed are still going include 2BL, 2FC, 3LO, 3AR, 3UZ and 4OG. Even then the "Call Book" had problems — 2WI was shown against two different operators and the 3B— series of calls preceded the 3A— series.

Australian and New Zealand ships equipped with radio were listed against their callings.

The advertisements are fascinating. A 1 valve set was available for £3 and 5 valve sets from £24-32. An RCA Raditron (valve cost 17/6 and 1.5V cells 3/-). Strange to think that all the latest gear advertised in this magazine today will seem quaint also in 50 years time.

WIA EDUCATION

The Education Committee has met twice so far. Graeme Scott VK3ZR is Chairman with John Wilson VK3LM and Peter Collins VK3BFG as members.

All are teachers and have a background in Radio and Electronics training. The committee set some priorities at its inception. The major one was to draw up suggested syllabi which instructors can follow in amateur

radio courses. Also a published syllabus, if adopted by the P and T Dept. will lay down a framework for the course to which exam questions can be set. The Novice syllabus is expected to be handed to the P and T Dept. by Nov. 30th, 1976.

Interested persons are invited to forward suggestions, proposed syllabi for other exams, and multi-choice questions to the chairman via the Executive Office, York.

The P and T Dept. recently asked the WIA to forward 100 multi-choice questions to create an exam bank. This has been done and further follow-up with more questions is welcomed from members. On the Youth Radio front there is little to report at present.

Graeme VK3ZR,

WIA Education Co-ordinator.

"To Be or not To Be" — A "Ham" (let)

Doug Anderson VK3ZW, Director Victoria Promotion Committee.

We have all experienced the amused cum tolerant smile as the layman says "Oh so you're a ham are you?" and although my skin is relatively tough, the connotations of the word "Ham" and its consequent public relations value have often caused me to wonder why we accept such a title. I must confess I prefer the term "Amateur".

However, let the Oxford Dictionary (5th edition) be the judge. I quote an extract:

"Ham — (sl) an operator of an Amateur radio station. An inept performer or ineffective actor, one who rants and overacts, (sl) Hamfisted, Hamhanded, One who is heavy handed and clumsy".

"Amateur — One who cultivates a thing as a pastime".

Of course its either a matter of habit or taste and in some instances the observance of some obscure tradition that causes the term "Ham" to continue to describe us and our activities but for my part, if any of my neighbours regard me as a "Ham" when they experience their next dose of Hi-Fi, I then I hope they don't look me up in the dictionary.

WHO ARE YOU?

Mike Thorn VK3ZVN

In October 1975 the Eastern and Mountain District Radio Club changed its venue from the Mooroolbark Technical School to the C.L. Willis room in the Nunawading Civic Centre. At its first meeting in the new venue, the club was addressed by the then Mayor of Nunawading, Cr. Peter James. Of the many topics that Peter spoke about perhaps the one that really struck home was "Who are you? No one in the eastern suburbs has heard of you and what you do".



OVERALL VIEW OF THE DISPLAY AT THE LIBRARY

Like most other amateurs, we had taken the view that it was impossible to get publicity in the local press and therefore, did nothing about trying. However Peter's words did not fall on stoney ground and at subsequent committee meetings much discussion centred around publicity and what we could do. As a result, earlier this year, it was decided to approach the Head Librarian at Nunawading Library. Librarian had noted that the library regularly had static displays of various skills and crafts, why not amateur radio? There was only one way to find out. Very tentatively, I made an appointment to front the lion in its den.

To my delight and surprise I was greeted as manna from heaven. A local organisation was actually interested in its library! The library staff, led by Constance Pavey, the Head Librarian, were actually grateful to us for offering to put on a display. Very quickly a date was decided, it was to be National Library Week, 11-18th September.

To put it mildly, we were on the spot. No-one had anticipated quite that reaction, and we had only a few short months to get it all together. Planning began immediately. Fortunately the library had four large show cases and two domed display units. A visit to the library with a tape measure to get the sizes of the show cases and to decide what to put where. The final layout decided by sub-committees was for a central photographic display with the showcases around it in the central area of the library. Each of the showcases was to cover a specific subject i.e. Test equipment in one, antennas in the second, VHF Mobile/portable equipment in the third and HF equipment in the fourth.

The two domes would contain home brew equipment. A portable station would

be installed in the foyer on each Saturday.

The search for suitable photographs began and here again we struck it lucky. One of our newer club members, Reg Gouge, was a keen amateur photographer. Reg was very quickly railroaded onto the sub-committee with a brief to obtain suitable photographs. An approach was made to both the Federal Executive and to the Victorian Division. Very willing help was given by both and photographs and literature provided. The final layouts of cases and display boards was decided upon and equipment for the portable station in the foyer had been arranged.

On the evening of Friday 10th, a shower of equipment, amateurs, photographs and other display material descended on the library and with much rushing around and numerous cups of coffee, all was nearly ready for library opening time the next day.

Unknown to us the librarian and her staff had earlier prepared and printed a supply of handbills and these had been despatched to all schools, business houses and various community organisations throughout the City of Nunawading. In addition, several large posters had been displayed in the library itself.

Saturday morning and about an hour before opening time, club members arrived to set up the portable station in the foyer and to put the finishing touches to the static display. Finally all was ready and we waited to see what sort of response there would be from the public. It was enormous. The library was crowded all day and great interest was shown in the Static display and the station.

WHAT DID IT ALL ACHIEVE?

Constance and her staff were delighted at the public's response. Using their

measuring sticks of book issue and new enrolment, book issue was the third highest ever, and new enrolments doubled the Saturday norm. So obviously the involvement of the library in the exercise was worthwhile.

Constance has already spoken to other librarians around Melbourne and from what she tells me, the interest is very high. There doesn't appear to be any reason why the same interest shouldn't be evident in other parts of Australia.

From our point of view it was also a success. Although we did not have a means of objective measurement, we feel we succeeded in our main aim of showing the public what amateur radio was all about. Of course, we gained some new members, but it was not meant to be a recruiting exercise.

We've learnt from the exercise too. We should have had the station operating each evening the library was open. There is a need to display information on the QSO in progress. It is very hard to hear what the operator is saying so the audio on transmission needs to be broadcast on the extension speaker as well as the received audio.

As far as the static display went, we wouldn't do it very differently next time — and there will be a next time without doubt. The local newspaper printed a follow-up article as well as announcing the display in the issue in the week prior to Library Week. So we gained valuable publicity in the local press as well.

If any Club or group would like to know more about the details of mounting such a display, write or call the Club Secretary P.O. Box 87 Mitcham, Victoria, 3132, and we will be only too happy to assist in any way we can. ■



THESE MODELS DISPLAYED WERE BUILT BY NICK VK3ZND



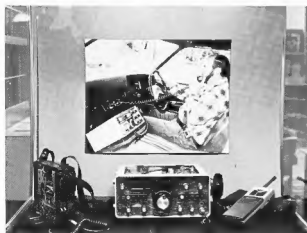
PART OF STATIC DISPLAY WITH WALL PHOTO OF JOHN VK3JH



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Application	SSB- Transmit.	SSB Receive	AM	AM	FM	CW RTTY	CW RTTY
Number of Filter Crystals	2	8	8	8	8	4	8
Bandwidth (6dB down)	2.5 kHz	2.4 kHz	3.75 kHz	5.0 kHz	12.0 kHz	0.5 kHz	0.5 kHz
Passband Ripple	< 1 dB	< 2 dB	< 2 dB	< 2 dB	< 2 dB	< 1 dB	< 0.5 dB
Insertion Loss	< 3 dB	< 3.5 dB	< 3.5 dB	< 3.5 dB	< 3.0 dB	< 5 dB	< 6.5 dB
Input-Output	Z _i	500 Ω	500 Ω	500 Ω	1200 Ω	500 Ω	500 Ω
Termination	C _t	30 pF	30 pF	30 pF	30 pF	30 pF	30 pF
Shape Factor	(6:50 dB) 1.7	(6:60 dB) 1.8	(6:60 dB) 1.8	(6:60 dB) 1.8	(6:60 dB) 1.8	(6:40 dB) 2.5	(6:60 dB) 2.2
		(6:80 dB) 2.2	(6:80 dB) 2.2	(6:80 dB) 2.2	(6:80 dB) 2.3	(6:60 dB) 4.4	(6:80 dB) 4.0
Ultimate Attenuation	> 45 dB	> 100 dB	> 100 dB	> 100 dB	> 90 dB	> 90 dB	> 90 dB
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XD-9-02	10 kHz	-24 mV/kHz	\$24.10	
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MEASUREMENTS ON LINEAR AMPLIFIERS

AN AUDIO STAIRCASE GENERATOR

During and following the development of the VK3AAR Linear Amplifier (AR April, May and June '76) I became interested in measurements on sideband amplifiers, and in tuning methods. Whilst a lot of what was learned is of not much more than academic interest, several observations were made which are worth repeating. I don't for a minute suggest that these observations are "previously unknown", but from some of the sounds that you hear on the air, a lot of operators have forgotten.

The first observation concerns power and VSWR meters. Whilst the low cost parallel line SWR meters do provide a reading that is related to the real SWR, they are rather sensitive to voltage levels on the line. As a result, readings vary with position on the line and with the input power level. Link type meters that are really directional power meters, Sierra, Bird thru-line, Collins etc., do not suffer from this problem to anywhere near the same extent. The unfortunate part of it is that

the lesser VSWR meter errs very much on the optimistic side. A feedline which showed 1:1 on a Hansen FSS showed 1.5:1 on a Bird Ham-Mate 4351. Introduction of some more cable between the load and the measuring point left the Bird meter much the same, but inspired the Hansen meter to read 1.3:1. Now we all know that for a lossless system, the VSWR is constant along the line, and 1.5:1 is probably the right figure. I am indebted to Tom, VK6MK for drawing to my attention an article in CQ for July 1975, which treats this subject in somewhat more detail.

The second observation concerns that wide subject of tuning, loading, output and linearity, all of which are interdependent. I touched on this subject briefly in the construction article mentioned above. Playing with a normal power amplifier with Pi-coupler output fitted with a power output meter and a monitor-scope or high frequency oscilloscope, will soon display the following observations.

If output coupling, or loading, and tuning are optimised for each of various input conditions, say single tone at full power, tenth power, 2-tone, and voice, it will be found that it is possible to tune towards maximum power on the meter, or

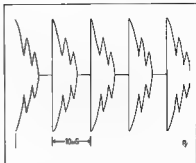


FIG. 1

maximum amplitude on the 'scope screen. A whole range of settings for the load and tune knobs will be discovered, and depending on the design of the amplifier, the comparisons will not necessarily be the same.

The problem is, under what conditions should an amplifier be adjusted, and to what parameters? Surely it will depend on the service for which the amplifier is to be used. RTTY or SSTV will have a fairly fixed duty cycle under signal conditions, and a static output can be displayed on the scope, and the amplifier can be adjusted accordingly. For CW, single output level from a mechanical 'd.t.er' will provide a usable signal. But what do we do for voice? There is a wide peak to average energy ratio range to be found amongst operators' voices. We have all heard the "peaking" and "smooth" voices, to consider the extremes. Have a look at the waveform of your voice (at audio frequencies) on an oscilloscope, experiment with various sounds, and you will discover that there is considerable variation in the peak to average energy ratio within one voice, let alone from voice to voice. However, considering no distortion, a couple of things are obvious.

- (1) The ratio is nothing like single tone.
- (2) The ratio is nothing like 2-tone.

Yet these are the two most common

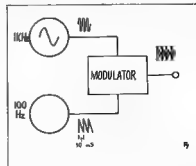
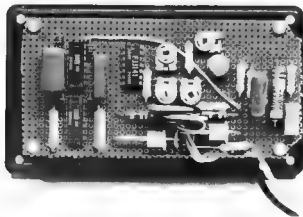


FIG. 2



COMPONENT LAYOUT — AN AUDIO STAIRCASE GENERATOR

Photo. Ken Reynolds VK3YCY

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VHF EQUIPMENT

HF EQUIPMENT

Cat D-2520	Kerwood TS520S transceiver, 80, 10m, SSB/CW, 240V & 12V operation.	\$570.00
Cat D-5201	Kerwood VFO-D-520 remote VFO for TS520 transceiver.	\$88.00
Cat D-5202	Kerwood SP 520 remote speaker for TS520 transceiver. (Also for TS520, see below)	\$34.00
Cat D-2110	Kerwood TS520 transceiver, 160, 10m, SSB/CW FSK.	\$800.00
Cat D-2111	Kerwood VFO-D-820 remote VFO for TS520 transceiver.	\$137.00
Cat D-2112	Kerwood DGI digital display (option for the TS520 transceiver).	\$184.00
Cat D-2530	Ailes 210 transceiver, 80, 10m, 200W input, SSB & CW.	\$999.00
Cat D-4308	Hy-gain TH3MK3 antenna, 3 el. beam, 20, 15 & 10 m. 5 dB gain, 1/2W rating.	\$195.00
Cat D-4308	Hy-gain TH6DX antenna, 6 el. beam, 20, 15 & 10 m. Pentastatic F/B ratio.	—
Cat D-4301	Hy-gain 18AVT antenna, 24ft. alt. standard vertical 180° 101 foldout construction.	\$93.00
Cat D-4330	Hy-gain 14AVQ antenna, 40, 20, 15 & 10m, 19 ft vertical.	\$140.00
Cat D-4705	RAK 58QN antenna, dipole for 80, 40, 20, 15 & 10m SWR 1.2, 1/2W rating.	\$175.00
Cat D-4704	RAK ALBQ 400X antenna, loaded dipole for 80 & 40m, 52 ohms, Max legal power.	—
Cat D-4150	Hustler 48T V antenna, 40, 10m vertical. Max SWR 1.6, 1.25 ft high.	\$99.00
Cat D-4152	Hustler MO-1 mobile mast, suits all RM series resonators.	\$175.00
Cat D-4154	Hustler MO-2 mobile mast, as above but bumper mount pg.	\$25.00
Cat D-4156	Hustler RM50 resonator for 80 metres, suits to MO-1 or MO-2 (see listing).	\$25.50
Cat D-4158	Hustler RM40 resonator for 40m.	\$25.50
Cat D-4160	Hustler RM20 resonator for 20m.	\$21.50
Cat D-4162	Hustler RM10 resonator for 15m.	—
Cat D-4164	Hustler RM1 resonator for 11m.	\$17.00
Cat D-4166	Hustler RM10 resonator for 10m.	\$17.00
Cat D-4170	Hustler 58N2 antenna mount (mobile) inc. 180° adj. stainless steel ball.	\$22.50
Cat D-4180	Hustler MM1 coil mount, includes 180° ball end and SO-239 ext. Accepts PL259 plug. Dummy load 50 ohms, rated 100W cont. (mt. would be far higher).	\$6.50
Cat D-7010	Shure 1006 TV filter, low pass 30MHz, 52 ohms loss 0.7dB, max. atten. 50dB.	\$18.75
Cat D-7060	Shure 1006 TV filter, low pass 30MHz, 52 ohms loss 0.7dB, max. atten. 50dB.	\$18.75
Cat D-7190	MC-701 microphone compressor. 250dB max. hi-fi variable interface baffles.	\$36.50
Cat D-5500	HC-500 antenna coupler. Tunes any antenna for 1.1 SWR, 3.5 - 30MHz. 52 ohms input.	\$138.00
Cat D-7200	6KDB transmit (ing) valve.	\$8.55
Cat D-7201	85-8 transmitting valve.	\$8.25
Cat D-7202	6148 transmitting valve.	\$9.00
Cat D-7203	8106 transmitting valve.	\$12.00

Cat D-3100	Kerwood TS100A transceiver, 2m, SSB FM, CW & AM. AC/DC, 22 channels. Spec. alt. Multi 7 2m transceiver. 23 channel capacity (one channel listed) FM.	\$599.00
Cat D-3007	Multi 7 2m transceiver. 23 channel capacity (one channel listed) FM.	\$189.00
Cat D-3010	Multi 7 2m transceiver. SSB CW FM 2m, 144, 148MHz in 100kHz steps. AC/DC.	\$950.00
Cat D-3050	Kyokuto FM144 105X transceiver. Synth. FM, 144, 148 996MHz. 10W or 1W output.	\$315.00
Cat D-3500	Europa B transceiver. 28.30MHz to 144-148 MHz. Capable of any mode trans. uses.	\$238.00
Cat D-3502	Kerwood TV 502 transceiver, suits TS520 transceiver, output 144, 148MHz.	\$240.00
—	Icom IC202 transceiver, 2M SSB & CW. Covers 144, 148MHz comp. portable.	\$183.00
Cat D-4620	Green G4620 antenna, 5/8 148MHz 1/4 50MHz. S/SW whip, 1.2m long.	\$22.50
Cat D-4200	Hustler GC 144A column base antenna, shunt fed, SWR 1.2 1.1. Stands 100cm w/d.	\$79.00
Cat D-4500	3Y2U antenna, 3 element beam for 144 MHz gain of 5dB. knockdown for portable use.	\$14.00
Cat D-4610	RAK 425 antenna, 1/8 wave 148MHz. series whip, standard PL259 plug base.	\$6.75
Cat D-4611	RAK 825 antenna, 5/8 wave 148MHz, series 1.25m whip, PL259 base.	\$9.75
Cat D-4650	Antenna system basic 3, takes 3/8 rod for making beam antennas, nite, std type. NAG50X linear amplifier for 8m beam, 10W drive for 100W out. - but I supply NAG144X linear amp for 2m beam, same specs as above but 1.1.	\$40.45
Cat D-2807	Duqu SH9 receiver. 2m, FM, 11 channel plus VFO 146, 152MHz 12V DC.	\$97.50
—	Ham Prods ERB RF Amplifier 1 or 6m, 20 30dB gain for rec. 9 - 12V DC @ 15mA.	\$21.80
Cat D-3802	Ham Prods ERB RF amplifier, 2m, same specs as above.	\$21.80
Cat D-3832	Ham Prods LKXC converter. 2m. for 52.5 MHz IF output. 2m to 20MHz.	—
—	Ham Prods LKXC converter. 2m. for 144 148MHz IF output. 2m to 30MHz.	\$27.50

SWL EQUIPMENT

Cat D-2850	Yama Motor PRC 7 receiver. 500kHz 30MHz. Wadley Loop. 240-12V. 0.25W sensitivity.	\$275.00
Cat D-2856	Kerwood QR 666 receiver. 170kHz 30MHz. All modes FM optional, band spread. 30MHz.	\$229.00
Cat D-2801	Orlik SSR 1 receiver. 550kHz 30MHz. Wadley Loop. 5kHz dual accuracy, 3 way power.	\$390.00
Cat D-4701	RAK Interfer 1 V antenna. 3, 30MHz with trap. Comp. assembled. Ideal for DX work.	\$18.75
Cat D-4703	RAK Laster 3. Long wave d.c. stop and with balun & all accessories, 3, 30MHz. with mate.	\$42.50

ACCESSORIES

Cat D-7104	H mount Morse key. Double bat. pivot rollers and adj. spring. Contacts for break-in keying.	\$19.75
Cat D-1340	Oker Bell SWR200 SWR & power meter. 3 30MHz, Pwr. D. 2W. SWR 1.1. Infr. tv.	\$97.50
Cat D-1360	F55 SWR/power meter. 3, 30MHz, dual amp. Pwr. D. 100W. SWR 1.1. 1.3.	\$29.50
Cat D-5310	RAK BL50A balun. 52 ohms unbr. 7/2 52 ohms bal. 1 shape, use as centre support for d.p.s. or T.O.T. antenna switch. recess mobile! Tunes the antenna off to avoid wadley & d.c. trap.	\$17.40
Cat D-4508	55727 Slow Scan TV. Receives both SSVT & ordinary TV. 240V AC operated.	\$6.75
Cat D-2875	Apollis 3 position manual switch. Low inter-fer. p.d. PL259 connectors.	\$598.00
Cat D-5204	Apollis 3 position manual switch. Low inter-fer. p.d. PL259 connectors.	\$18.50

NOVICE EQUIPMENT

Cat D-1700	Mid and 13.892 transceiver. SSB/AM 11m, 23 channels. RF gain controls, etc.	\$239.50
Cat D-1436	Mid and 13.882C transceiver, AM, 11m, 23 channels, delta tone, ant. warning light.	—
Cat D-1430	Mid and 13.820 transceiver. 11m, AM for budget minded. 23 channels. SW input.	\$109.50
Cat D-4142	Mobile 1 helix antenna. 11 metres, covered in durable plastic. B/L base.	—
Cat K-3134	Novice Transceiver Kit. Build yourself 27MHz to 5MHz novice channels. Max. output.	—

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"formal" tuning conditions. However, there are the "Haasarooww" tuners, and I am one of them, that try to simulate an average voice for long enough to observe the heavy static pattern on the scope and make appropriate adjustments to exciter load and tune, linear load and tune, and mike gain. Not very satisfactory, and not very polite either!

Some wit on air considered that I should build an electronic "AAR" (read "Ah") generator. It would say "Ah" as long as the batteries lasted, and would give a static approximation of a voice waveform for long enough to allow for considerable experiment. So I plugged a mike into the rig and observed that without compression and processing, my voice averaged the oscillogram of fig 1, when viewed at the antenna. The repetition rate was about 100 Hz, in a rough triangle form. Such a waveform would be quite easy to generate. A tone of about 1 kHz modulated by a triangle wave would yield the required waveform as shown in fig 2. Modification of the 100 Hz triangle wave would tailor the generator to any particular voice.

So there we are, a waveform that will allow the operator to set his output controls so that the output is at a maximum with a waveform at the output that can be made as similar to the input as he likes.

Note that if the envelope frequency is too close to the modulating frequency, unwanted outputs will be developed that will change the character of the wave.

All the same the method is useable. However, there are still problems in interpreting the output wave form. The shape has still to be compared with a picture of

the original, in much the same way that a 2-tone output has to be judged. Whilst gross distortion is obvious, small deviations from the ideal are not so evident.

At this stage I borrowed a page from the testing methods used in television circuits. One very effective method of measuring linearity in television is to measure the height of successive steps in a staircase waveform. In particular, a modulated staircase is used to examine the performance of a video link at the colour subcarrier frequency. So why not a version at audio frequencies? The height of successive steps could be examined at the output of the transmitter, and the effect of each control in the system can be examined in turn. It is very obvious when the top step begins to crush, and it is very obvious when the transmitter output, on the top step, is at a maximum.

The advantages of using a test signal of this type are beginning to mount. The waveform is fairly similar to that of a voice, deviations from good linearity are fairly obvious, and the testing power level is at 25% of the PEP value. At this level there is little danger of anything overheating if the system is fairly well tuned.

The generator that I built is described here.

The staircase repetition rate and the modulating frequency were not more than an educated guess, 33 and 1700 Hz being chosen so as to have 10 cycles of audio on each step of 5 steps. 1700 Hz was chosen as being somewhat on the high side of the middle of the audio band of most transmitters. The block diagram of fig 3 shows the principle of operation. The non-symmetrical square wave 170 Hz oscil-

lator "A" is counted by the modulo-5 counter "B" whose outputs are weighted into a low resistance by network "C" to give the staircase as shown. This signal is used to modulate the output of the 1700 Hz oscillator "D" in the balanced modulator "E". The output of the modulator is put through a very simple RC low-pass filter "F" to produce the required waveform.

The detailed circuit diagram is shown in fig 4 and is quite straight forward. A total of 4 integrated circuits are used, TTL for the oscillators and counter, and the general purpose C 1496 for the modulator. It all fits on a piece of matrix board, 10 by 5 cm. The 4 controls are set as follows: RV 1, 2, 3 are set to obtain as close to even steps as possible at the input to the modulator, with a total amplitude of 150 mV. It will not be possible with this circuit to obtain exactly even steps, but the available result is quite acceptable.

RV4 is set to obtain ± 6 volts on pin 6 of the MC1496. A slight adjustment of RV4 may be necessary to obtain a symmetrical output when viewed on an oscilloscope. It might also be necessary to readjust RV1, 2, 3 to obtain equal steps in the modulated steps. The output of the prototype had a peak to peak amplitude on the top step of 1 volt. The power was provided from a $-9, 0, +9$ volt supply. A couple of 5.1 volt Zener diodes provided regulated rails for the TTL chips and the reference potential. Make sure that the 1700 Hz modulating frequency is within the audio range of the transmitter, as a 4 kHz signal for example just won't get through most filters used in sideband service.

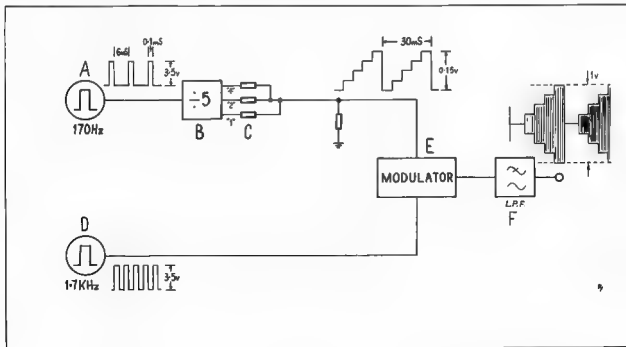
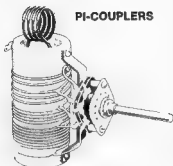


FIGURE 3



PI-COUPPLERS

WILLIS MEDIUM POWER TYPE

For use up to 600 watts p.e.p. Match plate loads of 2000 to 3,500 ohms (2) and higher into co-axial cable. Operating Q increases on higher frequencies to increase harmonic suppress on enabling practical values of tuning capacity to be used on 10 and 15 metres and allowing for wiring inductance (L) incorporating extra switch section for shunting additional capacity (C) if required, or switching other circuits. Switch rated for 10 amps at 2,000 volts with contact resistant (R) of 0.8 mil-i-ohms.

Suggested for use in "A LINEAR POWER AMPLIFIER FOR AUSTRALIAN CONDITIONS" (Reiser "Amateur Radio" April, May & June issues, 1976).

PRICE: \$23.95

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The symbols are always transmitted at the same speed — otherwise their aural characteristics alter and only the spacing between groups slowed down or speeded up as the student gains proficiency.

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2.06	3/4	8	3 No. 3006	\$1.16
2.16	3/4	16	3 No. 3007	\$1.16
3.08	1	8	3 No. 3010	\$1.40
3.16	1	16	3 No. 3011	\$1.40
4.08	1	8	3 No. 3014	\$1.56
4.16	1	16	3 No. 3015	\$1.56
5.08	1 1/4	8	4 No. 3018	\$1.75
5.16	1 1/4	16	4 No. 3019	\$1.75
8.10	2	10	4 No. 3907	\$2.52

Special Antenna All-Band Tuner Inductance

(equivalent to B & W No. 3907 7 inch

7" length, 2" dia., 10 TPI Price \$4.36
Reference A.R.R.L. Handbook 1961

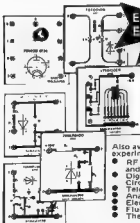
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W3



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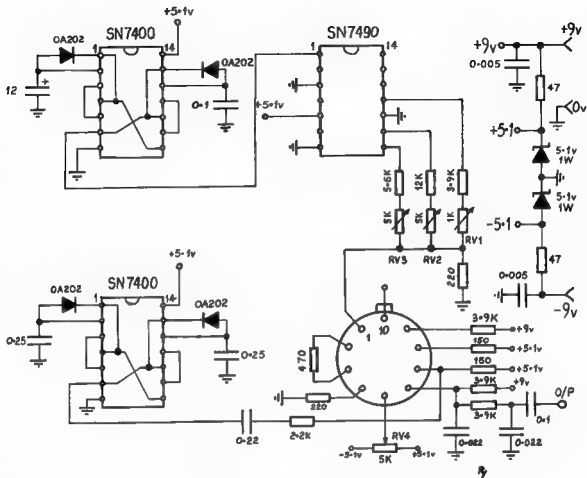


FIGURE 4

My transceiver uses a tip-ring-sleeve type of mike connector, so I fitted such a plug to the generator, with the tip connected to earth so that the Tx is operated whenever the unit is plugged in.

The circuit of fig 4 was theoretically derived, and when I put it together, it worked much as I expected and further development was not necessary. Thus there may well be some details that could be further developed or varied to suit individual tastes.

In use, without speech processing, the oscillogram at the output of the transmitter will be similar to that at the mike input, but only if the system is linear. The 1700 Hz modulation will of course appear as 14 MHz odd on the 20 metre band for

example. Inadequate filtering at the output of the generator results in a small amount of ripple on each step, although it is not a nuisance. So, set the load and tune controls for maximum amplitude top step, with even steps at the same time, setting the mike again so as not to cause overload. If you use an in-line power meter, note the reading and multiply by 4 to obtain the PEP output on equivalent voice peaks. You may well get a surprise when you compare it with the result of a 2-tone test. The chances are that the PEP output on equivalent voice peaks is higher than the 2-tone PEP by 20 to 40% since the average system loading on power supplies is lower. Unplug the star-step and plug in a mike, and adjust the mike gain for voice peaks

of about the same level as the level on the top step as viewed on the 'scope, and you will have an optimised signal that is one of the cleaner signals on the band.

The use of the generator does not end here. It may be used to observe the operation of speech processors, which, after a little only modify the linearity of the system in an ordered way without overloading the system, hopefully. A linearity fault in a system may be examined by observing the linearity at intermediate points with the aid of a suitable probe. At VK3AAR, this unit has certainly replaced the 2-tone generator, and may well disappear inside the exciter to operate in the "tune" position.

**DRAKE**

R. L. DRAKE COMMUNICATIONS GEAR

DSR2 Digital readout communications **RECEIVER** 10 kHz-30 MHz continuous coverage, fully synthesised, for AM-USB-LSB-CW reception. **\$3495.**

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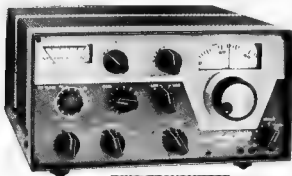
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SSR1 Synthesised communications **RECEIVER**. Provides continuous coverage 500 kHz to 30.0 MHz for AM-USB-LSB reception. Operates from AC Mains or internal batteries. **\$290.**

TR4C sideband **TRANSCEIVER** full amateur band coverage 10 through 80 metres. **\$630.**

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MN4 and **MN2000** **MATCHING NETWORKS** — enable Feedline SWRs of up to 5:1 to be matched to the Transmitter. Built-in Wattmeter. MN4 handles 200 Watts. MN2000 handles 1000 Watts continuous and 2000 Watts PEP. MN4 **\$115**, MN2000 **\$230.**



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TELETYPE MESSAGE AND KEYBOARD GENERATORS

H. G. Kociemski VK4ZAP
81 Spring Street, West End,
Brisbane, Qld., 4101

Expensive and complex mechanical GONKULATORS are now defunct, or nearly so. This design was originally intended to replace the transmit section of the mechanical teleprinter, and indeed it could do so if a keyboard was installed at the input to the code converter. However, problems may be encountered with contact bounce.

MESSAGE GENERATOR:

Basically, the device is a 5 unit code generator which can generate a sequential message e.g. "VK F/S 2 L/S ZHK SPACE TEST C/R L/F" and repeat, in standard teletype form complete with start and stop pulses.

The output of the device is standard TTL logic and can be used to drive an FSK or AFSK transmitter, though this has not been tried yet.

The unit functions very well, giving virtually zero distortion 20 mS pulses (variable) in serial form. Commercial practice dictated the use of 30 mS stop pulses. The stop pulses here are 20 mS (due to ease of design), however, it will generally be agreed that this is inconsequential.

I have tested the device on OTCs standard mechanical 50 and 75 baud teleprinters via a mercury wetted polarized relay and double current to single current converter.

Operation starts at the Automatic Sequence Generator which is driven by a (variable speed) clock. This sets the rate at which letters are printed.

The binary counter sequentially addresses the 1 of 16 decoder causing a sequential logic zero on each of the output lines. Hence the output of the transistors driver goes high and forward biases the respective diode encoder.

Hence the 5 unit code is generated in parallel form, and is displayed on the LEDs.

The 5 input NOR gate senses the presence of the 5 unit code and triggers the monostable multivibrator which "loads" the shift register within 3 microseconds. When the monostable returns high, the shift register is already loaded and immediately clocks the data, including the fixed start and stop bits, out to line.

The serial data is now a 7 unit code and could be used to drive a teleprinter

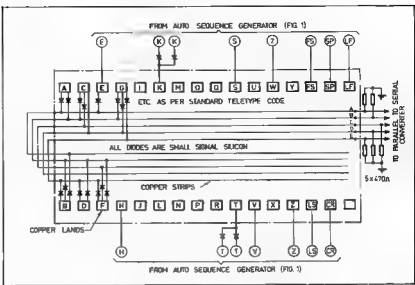


FIG. 1. DIODE ENCODER, PRACTICAL CONSTRUCTION

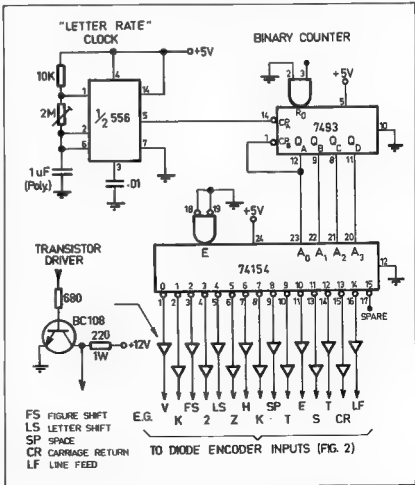


FIG. 2. AUTOMATIC SEQUENCE GENERATOR



45W, TWO METRE P.A. KIT

(ETI.710). Improved design now using CTC B40-12, for FM or SSB (linear) service.

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Motorola MRF603 1W in 10W out, 12.5V, class B/G to spec. Use as hot subst. for 2W0000. Inc. data

\$6.50 !!!

(normally \$11.90).

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B3-12 and MRF603

\$11.20 the pair

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Simply connect direct to your 2 metre rig, 12 volt supply, fit 70 cm antenna for instant SSB, FM, AM, CW operation.

FEATURES High quality double-sided glass fibre printed board ★ Highly stable zener controlled oscillator stages ★ PIN diode aerial changeover relay with less than 0.2 dB through loss ★ Extremely low noise receive converter typical 3 dB ★ Separate receive converter output gives independent receiver facility ★ Built in Automatic RF VOX with override facility ★ Built in 10 watt 144 MHz termination, selectable attenuator for ½ watt ★ Use of the latest state of the art Power Amplifier transistors provide reliable 10 watts continuous output. Limited supply only available ex stock, further units currently on order for expected early delivery

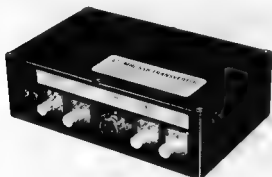
Model MMT432/144 — Price \$235, pack and post \$2

TRANSVERTER MODEL MMT432/28

FEATURING COMBINATION OF A LOW-NOISE RECEIVE CONVERTER AND A LOW DISTORTION TRANSMIT CONVERTER PRODUCING A SPURIOUS-FREE LINEAR SSB SIGNAL, PARTICULARLY WHERE HIGH STABILITY AND SENSITIVITY ARE OF IMPORTANCE

Power Output 10 watts minimum ★ 28 MHz IF ★ Drive 1 mW to 500 mW ★ Aerial Changeover by PIN diode switch ★ Modern Microstrip Techniques ★ Power requirements 12 volt nominal at 150 mA 2.5 amp. peak ★ Case size 187 x 120 x 53 cm ★ Spare 432 input socket.

MODEL MMT432 — Price \$195 add pack and post \$2



MMT TRANSVERTER

500 MHz PRESCALER

THIS PRESCALER USES HIGH SPEED ECL TECHNOLOGY TO ACHIEVE × 10 OPERATION TO A FREQUENCY OF 500 MHz.

★ Case size 111 x 80 x 27 mm ★ Frequency range 50-500 MHz ★ Sensitivity, better than 200 mV RMS over above range ★ Input Impedance 50 ohm, BNC connector ★ Power requirements 11-15 volt DC at 100 mA approx

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All modules are enclosed in black cast-aluminium cases of 13 cm by 6 cm by 3 cm and are fitted with BNC connectors Input and output impedance is 50 ohms. Completely professional technology, manufacture, and alignment. Extremely suitable for operation via OSCAR 7 or for normal VHF/UHF communications.

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Model MMT144/28 — Price \$165, Pack and Post \$2

All MMT TRANSVERTERS are supplied with individual factory report. All units are housed in highly durable black diecast case, circuitry is constructed on high Q fibre printed boards. High power stages are housed in separate internal compartment.

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MODEL MMD050 — Price \$115 add pack and post \$1

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Noise figure typ. 3.5 dB
Overall gain 25 dB Price: \$58.

144 MHz MOSFET CONVERTER

2 silicon pre-amplifier stages. MOS-FET mixer. All UHF circuits in microstrip technology.
Noise figure typ. 3.8 dB
Overall gain typ. 30 dB
IF 28-30 MHz or 144-146 MHz 9-15 V 30 mA Price: \$45.

144 MHz MOSFET CONVERTER

Noise figure typ. 2.8 dB

Overall gain typ. 30 dB

F 28-30 MHz 9-15 V 20 mA

Price: \$39.

VARIABLE TRIPLER 432/1286 MHz

Max. input at 432 MHz 24 W (FM, CW) - 12 W (AM)

Max. output at 1286 MHz 14 W

Price: \$65.

Pack and Post \$1

The double NOT is necessary to keep the input of the 7430 from floating to a 1. (This input was originally tied directly to line 4 and caused a permanent 1 there).

The 4.7 uF capacitor was used to remove very fast transient pulses which tended to interfere with counter operation when certain keys were pressed.

(Note: Each counter should have a bypass capacitor at the supply pins for best results. The popular 7490 decade counter could also be used with similar decoding. Tech Ed)

KEYBOARD GENERATOR

As a companion to the RTTY message generator, this keyboard would make a valuable addition to the shack.

Further development of the Message Generator has produced a complete solid state teleprinter transmit unit, thanks to the recent availability of a good quality, low cost keyboard from Melbourne.

2 ICs and associated components are required to transform the original "fixed message" generator to a keyboard unit.

The big problem was elimination of false triggering due to contact noise and bounce in the keyboard.

Monostable M1 and M2, take care of this as can be seen from Fig 4. The monostables, as wired, only triggers on negative going edges.

With this simple but effective system, a criterion must be observed for correct code generation. The typing action must be carried out within the period of operation of monostable M1 i.e. less than 250 mS approximately (normal typing action), otherwise a false trigger will occur, producing an "all spaces" condition.

Even though the circuit has been modified, the fixed message facility still performs perfectly, and that part of the circuit is built on a plug-in board so that it is quite easy to change from keyboard to fixed message.

FOOTNOTE

The circuits shown here could probably be simplified somewhat to reduce component count and power consumption, but obviously works "as is".

Technical Editor ■

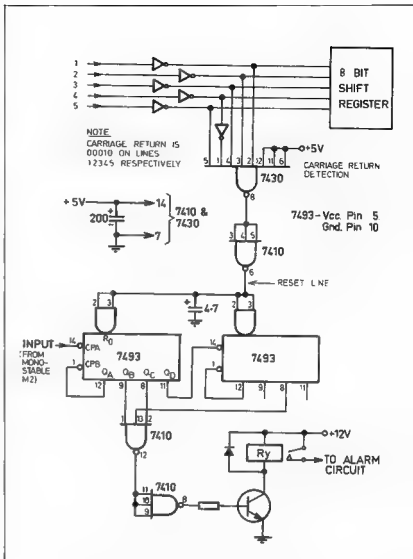


FIG. 6. CARRIAGE RETURN ALARM CIRCUIT.

A PERSONAL VIEW OF THE METRE WAVE SCENE IN THE U.K. NOW

Any expatriate amateur radio operator returning to his native UK after a few years in, say, VK or ZL would hardly believe his ears as he sampled the 2m or the 432 MHz bands today.

Very much a thing of the past, he would find, is the old geographical band planning he knew so well. Very much a thing of the

present in its place is band planning by mode. Old familiar beacon signals appear in new places on the dial. And new unfamiliar repeater signals are now to be heard popping up almost 24 hours a day.

Putting his sensations into one sentence, he would probably conclude that metre wave development in Britain was proceeding at a dynamic rate unsurpassed in any other area of amateur radio activity. He would be right, even if he looked at no more than the already mentioned 144

By Jack Hum, G5UM^o

^o(RSGB VHF Awards Manager, member of RSGB VHF Committee, conductor of "Four Metres and Down" column in Radio Communication from 1963 to 1974, member RSGB Council 1952-59, and a Vice President of RSGB)

MHz and 70 cm bands. He would be even more right if he took account of the rest of them from 70 MHz right up to 24 GHz.

It has not always been so. In the fifties it seemed as though the metre wave scene in the U.K. was frozen into the pattern it took up immediately after the war, when crystal controlled converters into main station receivers as IF strips, and simple amplitude modulated transmitters were the norm. The 2 m and 70 cm bands were subdivided by voluntary arrangement into

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THE RADIO FOR WORLD-WIDE LISTENING
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SYNTHESIZED COMMUNICATION RECEIVER



The model FRG-7 is a precision built high performance communication receiver designed to cover the band from 0.5-29.9 MHz. Its state of the art technology offers an unprecedented level of versatility. The Wadley Loop System (drift cancellation circuit) coupled with a triple converter super heterodyne system guarantees an extremely high sensitivity and excellent stability. It provides complete selectivity to amateurs as well as BCs with superb performance and many features such as RF attenuator, selectable tone, and automatic noise suppression circuit.

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Telephone 42 8136

POWER TRANSFORMER TYPE 6474

Specifications: 240/12, 6 V CT, 150 mA.
Dimensions: Mounting Centre 2-1/16". Mounting Hole: 5/32" x 16". Overall — Base, 2 3/4" x 1 1/2" — Height 1 1/2". Weight 7 oz.
Colour Code: 240 V Black, Red 12.6 V CT Blue, White, Blue 150 mA.

Price \$5.90

Postage \$1.00

ANTENNA ROTATORS

AR22L Antenna Rotator Decast construction to take lightweight VHF and HF beams. Complete with attractive control box which requires only 4 wire connection 240V AC. **\$85 each**

CDE HAM II Rotator for the heavier duty beam. Suitable all HF frequencies except 40m. Requires 8 wire connection, 240V AC. **\$185**

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SWR Bridge and Field Strength Meter Combination, 50 ohms impedance. **\$19.50**

Midband SWR Bridge and Power Meter Combination, 50 ohms impedance. **\$24.50**

REFLECT HORNS — 8 ohms

\$8.90 — Postage \$1.50

RADIO VALVES

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1T4	\$1.50
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zones related to frequency; if you wanted to work a station in Scotland or the north of England you turned your beam antenna that way and tuned only a restricted portion of the band in which Scottish and northern stations congregated. This obviated the chore of having to tune the whole of 144-148 or 432-434 MHz, which are the British communication allocations.

First indications that this pattern was to be unfrozen came when the F3 frequency modulator mode gathered some strength, followed later by the appearance of single sideband. At first these modes were regarded as disturbing to the ordered staccato of the 2 m and 70 cm bands to the extent that they were confined to spot frequencies, 144.48 MHz for FM and 145.41 for stereo A3J, the sport of kings, electronic kings at least and outside the competence of the drill-and-hacksaw kitchen table enthusiast who delighted in making things work for himself but not anything quite so fraught and frightening as single sideband at VHF.

Today it seems unbelievable that such a state of affairs existed little more than half a dozen years back. Frequency modulation is now the standard mode of voice communication not only in Britain but in VHF circles in most of the European countries that make up IARU Region 1. One should qualify this statement by adding 'voice communication for local contacts', for it is closely matched in popularity by A3J for DX working. Each is tidily compartmented, FM above 145 MHz and SSB below 144.5 MHz. The "bit in the middle" is occupied by a mixture of modes from slow scan television, local nets on FM, plus the last vestiges of amplitude modulated telephony that still remain.

The bottom 150 kHz of the British 4 m, 2 m and 70 cm bands is reserved for CW, still the best-ever mode for guaranteeing a sustained contact when all else fails and when even SSB, reading nil on the S-meter, at last peters out. To some, telegraphy remains the last bastion of true amateur radio, a romantic notion not shared by many: yet the fact remains that it is the last bastion of something else, and that is the ability to demonstrate operating skill. Where no skill is called for to actuate a press-to-talk button on a phone transmitter, a good deal of expertise is needed to tax through the finger tips via a Morse key, making it up in the head as you go along to emerge in the brain of the person at the other end as pure conversation, impeccably phrased and spelt.

COMMUNICATION BY PROXY

From this stage of direct communication via the A1 mode nothing could be in greater contrast, aver many VHF operators, than the concept of communication via repeater. Since the advent five years ago of the pioneer 145 MHz repeater developed by the radio amateurs at the Pye establishment and installed a dozen miles south of the city of Cambridge, repeaters have proliferated throughout the British Isles to an extent that saturation point has virtually been reached in respect of co-chan-

nelled VHF repeaters spaced at 100-mile intervals, and interest is now being turned on the development of a parallel chain on 70 cm. The 2 m chain has 600 kHz spacing between input and output frequencies, the 70 cm chain 1600 kHz.

Two primary causes of this burgeoning of the repeater ethic are, first the enormous increase in mobile operation in the U.K., where one fifth of the 20,000 amateur licenses also hold "Stroke mobile" permits (and most of them use VHF), and secondly the widespread availability of extra-transceivers readily adaptable to the amateur bands, and of Japanese "black boxes" that all too readily earn their owners the appellation of "appliance operators" with not the slightest effect on the huge sale of such devices.

Few developments on the metre wave scene in the U.K. have been so controversial as the repeater one. Extreme positions are taken up, expressed in such statements as "This isn't real amateur radio" to, on the other hand, "This repeater business is the ultimate in ease of communication". Both are right — up to a point! What is incontrovertible is the fact that repeaters have immensely extended the range of vehicle to vehicle equipments and probably made such communication safer than it was in the simplex days of one hand on the steering wheel and the other on the rig. And anyway, as one correspondent to the RSGB's *Radio Communication* remarked "If you don't like repeaters you don't have to use them. Metre waves represent a house of many mansions, and if you don't like one door try another!"

MANY MANSIONS

A look now through some of those other doors. One of them is labelled 70 MHz, it is the nearest thing to the American 6 m band which the British possess, and is peculiar to the U.K. Strangely, it is denied to the Class B licensees with their G6-plus-3 call signs and no Morse requirement. This at once reduces its population to those full-licence owners who find it a fascinating band capable of yielding DX well beyond the range to be expected on 2 m. But it is, one must confess, a minority interest.

So also are the microwaves. But here, as with 4 m, amateur curiosity impels exploration, helped along by the opportunity to earn special operating awards which the RSGB offer for long distance coverage on such bands either from home locations or from contest operation. Particularly on the microwaves, no "frozen into accepted patterns" is evident: antenna dishes *oude rigueur* become supplanted by Yagis, klystrons by Gunn diodes (or vice versa!)

Of other mansions, such as Oscar or high definition television, space prevents one from doing more than to record that they exist, enjoy an enthusiastic minority following and are productive of some surprising results.

HANDS ON TILLERS

Let it be thought that all this dynamic activity is random, self-generating or spon-

taneous, one had better emphasise that most of it is inspired, directed and generally assisted by the national society, the RSGB, operating through such bodies as the VHF Committee, the VHF Contest Committee, the Repeater Working Group and similar voluntary bodies that skilfully hold tillers on to true courses where in their absence there might well be some wild — perhaps dangerous — navigation.

For example, all beacons are an RSGB responsibility. So are the repeaters. The licences for all of them are vested in the RSGB by the UK amateur licensing authority.

Internationally, the RSGB works in close co-operation with sister societies on the mainland of Europe, or what is known as IARU Region 1, mentioned earlier. The dates and rules of metre wave contests are harmonised in this way. Farther ahead is the watershed of the 1979 World Telecommunications Conference, and the hard look it will doubtless give to amateur frequency allocations. Preparations to surmount it are well advanced in RSGB, and the metre wave content of those preparations is a very sizeable one. ■

THE FACE BEHIND THE MICROPHONE

Pictured is Graham Clements VK3TK.

Graham is currently the chairman of the VK3 division broadcast committee.

He first became interested in radio at the age of 12 when he began SWLing at commercial stations. He joined YRCS when he was 14 and progressed to senior level in approximately 18 months.

His limited licence (VK3ZLT) was obtained in 1972 and he became active mostly on 2MX FM and AM. In mid 1973 he joined the Broadcast committee, and obtained his full call in 1974.

He has been active on 40 and 20 DXing, and has now branched out to ATV which he thoroughly recommends to anyone who is looking for something extra-exciting.

Graham is presently studying for a degree in Communications Engineering (3rd year) at RMIT.

We wish him well in his ventures.



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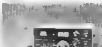
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THE DEATH OF AMATEUR RADIO AS A HOBBY

Andrew Davis VK1DA

Licensed 11 years, Member WIA, Life Member ARRL

The recent reports giving incredible statistics of the imports of CB radios to the USA (for example, over half the value of air freight shipments being CB gear) were rather mind-boggling.

I remember being surprised, too, on reading that "point-of-sale-licensing" is now being practised in the U.S.A. This is an elegant phrase meaning that you get your licence and call sign from the dealer when you buy your gear.

But the latest report is that all new cars coming out of Detroit will soon be equipped with a combination AM/FM stereo/CB transceiver radio as standard. Just think! Every new car with CB in it! Well, that did it! I now reckon it's only a matter of time before the craze really spreads to Australia. Sure, 27 MHz will be a mess, like it is in the States, but the "citizens" don't care about spectrum pollution any more than they care about other forms of pollution. The 27 MHz pirates currently screaming about "rights to communicate" will turn pale at the interference on the band they wanted to be free to use. But what will amateur's reactions to all this be?

Some will stick their heads into the proverbial sand and pretend it is not happening. Others will react with righteous indignation and others with relief. Some won't notice and won't care when they find out.

I guess some will castigate me for putting these ideas into print. After all, it's tempting fate to speak of unpleasant things, let alone put them into print. This attitude is one of the basic problems faced today by amateur radio, and in Australia, the WIA.

In his report, Bob Arnold stated that "the Institute's . . . policies must be geared to the closing decades of the 20th Century so far as events can be predicted". In recommending a change of name for the WIA he added that "the word Institute" is somewhat Victorian", so he feels that a change in name would help the members and the WIA to update to today and handle tomorrow better.

But he felt that the individual amateur and member was generally lacking something. "One of the interesting facets of life which has come out of the investigation is

the attitude of the amateur himself . . . Many comments . . . indicated a lack of understanding of various functions of the Institute . . . (one) hears the comment 'I do not have time to read AR or listen to the broadcast' but yet these people will talk in monosyllables for an interminable period, wasting many hours, a few minutes of which could be devoted to an understanding of the Institute. Perhaps this is part of our way of life today . . ."

In Future Shock, Alvin Toffler says that "as the rate of change in society speeds up, more and more older people feel the difference keenly. They . . . become drop-outs, withdrawing into a private environment, cutting off as many contacts as possible with the fast-moving outside world, and finally, vegetating until death".

I'm sure that this concept extends to organisations, too. Thus it is that the possible fate of the individual amateur, the WIA and the hobby itself is vegetation until death.

Our hobby could die of future shock. In order to cope with the future, the WIA must become more flexible, its members must open their eyes, not drop-out. Subjects like CB, the use of the term "radio ham", and the progressive commercialisation of our hobby cannot be ignored. They must be faced realistically, the emotional reaction must be filtered out.

A WIA Federal Council resolved to ban the use of the term "radio ham". Yet how are we known to the general public? You give the answer.

Facing CB realistically, let's see what is in it for us. Some CBers will never tire of endless non-conversations (uncomfortably similar to those conducted by many amateurs), but others will be drawn to the technical side of the hobby and will become valuable members of the amateur body. If 5% of CBers were drawn to amateur radio, our numbers could double within a few years. Check the figures yourself.

Where else will the much-needed infusion of youth and enthusiasm come from?

What would you find more exciting, as a person wanting to "talk on the radio", CB or amateur radio? The amateur bands are full of endless monologues, Morse,

broadcast stations etc. and few of the conversations one hears are technical in nature; few of the contacts are other than "skeds". DX activity on some bands is dominated by a few, who take offence if any other station attempts to contact their DX station . . . On the other hand, many CBers are interested in fiddling with their equipment and antennas to improve signals etc. Many, too, are young and enthusiastic about their hobby. The illegal nature of "CB" in Australia only adds to the attraction. I suggest that amateur radio must often lose to CB even when the person concerned is interested in radio as a technical/communications hobby. Can we really be surprised?

Take a realistic look at the international scene and amateur radio's chances at WARC in Geneva, 1979.

Far from gaining HF bands, we run a serious risk of losing HF and VHF bands or at least parts of them. 148-148 MHz is in danger, 420-450 even greater danger. So you're not a VHF type? Never mind, you need not be smug, if possession was nine-tenths of ownership, you wouldn't have much left of 3.5, 7 or 14 MHz. By all means keep the 60 kHz at 1.8 MHz!

But it is certain that the events of WARC 1979 will pass almost unnoticed by many amateurs. Unnoticed until they call CQ on a band no longer allocated to amateurs (I suspect that if amateur radio was declared illegal tomorrow, most skeds, DX activity, 2m FM contacts including repeaters would continue regardless for years. We would all be pirates, but amateurs now regard the use of "their" bands as a right rather than a privilege; does this sound familiar?)

Do you think your hobby is worth saving? I do, but scores of countries in the world do not (watch them vote in 1978).

To save it, we need to put on a new face and start thinking differently behind our faces.

Bob Arnold reckons the WIA needs a new face. Chances are, you haven't even read his report in April AR, so you couldn't be one of the uncaring ones.

Start taking Amateur Radio seriously. Or you may become a pirate.

— Reprinted from "Forward Bias", Sept., 1976. ■

AMATEUR RADIO AT EASTLAND

Graeme Scott VK3ZR

During the week July 26-31, the Box Hill Technical College ran a display of its various trade departments to show the public what courses are offered at the college. Parents of prospective students were able to speak to teachers and discuss the future careers of their sons and daughters.

The college amateur radio station VK3BHT was operated portable in the shopping centre at Ringwood. As part of the college's facilities are devoted to teaching radio apprentices and technicians (evening classes), and of course, the form 5 Youth Radio Club Scheme, radio had to be represented.

On Monday 26th, I took my 14AVQ vertical, which covers 40, 20, 15 and 10 metres and installed it on the roof of the Eastland Shopping Centre. For 2 metre FM, I borrowed a Ringo from V.com, and a power supply for the IC22a, and with the aid of some borrowed coax from Ball Electronics, we had our antenna system installed.

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The FT200, and the IC22a were set up on the desk and, with an appropriate display of QSL cards and posters, we were on the air.

It wasn't long before we were informed that our SSB transmissions on 7, 14, 21 and 28 MHz were disturbing colour TV reception of the Olympic Games! Oh Boy! what to do?

Andy VK3UJ, came to the rescue on Tuesday with a low pass coax filter. This however, did nothing to reduce the TVI. Later in the day, Andy tried his Uniden 2020 and the TVI was just as bad. We concluded that the TV antenna and our 14AVQ were too close; even though the TV antenna was line of sight to the Mt. Dandenong transmitters, just a few miles east of the centre. There was just plain overloading occurring in the Bresh's TV store antenna system.

I then decided that a high pass filter was the only way we could get rid of the TVI. The form of the TVI was evidenced by sound bars completely wiping out the picture, lack of sync., and the reversion of monochrome by almost all the receivers, which, incidentally, were of diverse brands — local and imported.

The ARRL handbook was consulted and a high pass filter was constructed in a box made from a P.C. board laminate. I established good PR with the store manager, who was delighted that I was trying to solve the problem, as sales were being affected! (We were affecting cassette re-



**JULIE, XYL OF GRAEME VK3ZB
OPERATING THE STATION**

orders etc. too, but that is another matter). Ultimately, the Olympics had priority.

I had no time to dip the coils in the filter, but just installed it in series with the coax to the store's distribution amplifier which was apparently overloading on our HF signals. Once connected, the filter degraded the TV signal slightly, so I tried spreading the turns on the coils, and achieved satisfactory pictures. Once that was achieved, I told the store manager that I'd start transmitting and would he watch for any further trouble.

As it happened, I could see some TV sets from my operating position and 7 MHz and 14 MHz signals had no effect,

on the Olympics etc. I felt that I'd achieved something, and proceeded to log many contacts TVI-free


Thanks to the excellent response and co-operation of amateurs contacted, I was able to put a number of members of the public onto the SSB and FM microphones and they were able to see Amateur Radio in action. The young boys, especially enjoyed talking to someone at the other end of the microphone

On Saturday 31st, many VK2's and VK5's were contacted on 7 MHz. My special thanks to Ern VK2AJ whose QSO I interrupted to obtain an interstate contact. Once established, we were called by VK5's, VK2's, VK3's and VK7's. Rob VK2AGK was worked 5-9-OSB mobile in Newcastle using a Uniden and a Hustler whip. You certainly were getting out well Rob!

Later on in the morning, VK3AMR at Monash University was contacted. The University's open day was on and an FT200 was being used with a G6RV to show off Amateur Radio at the Uni.


Overall I feel the display was a great success and it was gratifying to see so much interest in Amateur Radio. A few CBers were put on the right track, and might be doing the NAOCOP or AOCOP course at VK3BHT in the evenings in 1977.

WIA membership forms and amateur licence details were taken by many people, so hopefully the whole exercise has been, or will be, quite fruitful.




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REVIEW OF THE YAESU FT301D TRANSCIVER



It seems that the future is getting closer all the time. The Yaesu FT301D is a case in point. Contained in a package only 280 mm wide, 125 mm high, and 370 mm deep is a fully solid state, 200 watt input, all band HF transceiver with just about every feature that the imagination could conjure up.

However, back to the beginning. The advent of fully solid state HF transceivers for the amateur market has been slow and surprisingly from the United States rather than from Japan. Prior to the new Yaesu FT301 series there have been at least four different American models available in this country over the last year or two. One can only guess the reasons for the rather late appearance of the Japanese equivalent.

The Yaesu Mfg. Co. are to be congratulated on their new product which will undoubtedly set the pace for other manufacturers to follow.

The FT301 series consists of four models: either 20 or 200 watts input, with or without digital readout. The model to be reviewed has the full 200 watts input and the digital readout. Certain other features are optional and these will be itemised later.

TECHNICAL FEATURES

The FT301D transceiver covers all the HF amateur bands in 500 kHz segments. These are 1.5 to 2.0, 3.5 to 4.0, 7.0 to 7.5, 14.0 to 14.5, 21.0 to 21.5, 27.0 to 27.5 and 28.0 to 30.0 MHz in four segments. Operation is provided for SSB with upper or lower sideband, CW, FSK, and AM. The transceiver is supplied with the normal 24 kHz filter for SSB operation but it is possible to install both a 600 Hz filter for CW and a 6 kHz filter for double sideband AM operation. As far as is known this is the first time that a full bandwidth AM filter has been available in an HF transceiver.

Following in the tradition of the FT101E an RF speech processor is included. Another first in HF rigs of this type is a receiver notch rejection filter. Naturally all the other normal features that one expects are there. These include, noise blanker, calibrator, clarifier for receive or both transmit and receive, VOX, external VFO switching and fixed channel operation with eleven crystal positions provided. Three different AGC time constants are switch selected from the front

panel and allow fast, medium, and slow decay times.

In addition to the band coverage mentioned above, a bandswitch position is allocated for WWV reception on 5 MHz. This is slightly different to normal in two aspects; firstly in the frequency chosen, and secondly that it is fixed tuned to exactly 5 MHz, with an internal trimmer to set the actual zero beat point.

The transceiver requires a source voltage of 13.5 and is therefore all ready for mobile or portable operation from a normal car battery. For home station use the matching FP301 AC power supply is recommended. This unit is capable of delivering 13.5 volts at 25 amps with excellent regulation.

As the photo of the FT301 shows, it bears a strong resemblance to the FT212 two metre transceiver reviewed in the June issue of this magazine. It does indeed share the same front panel and cabinet as well as the plug-in printed board internal layout.

Another design feature of the FT301D is the broadband transmitter driver and output stages. This eliminates the need for the usual final tuning and loading controls. However, in common with all circuits of this type, a close 50 ohm match is required for the output stage to deliver maximum power. Perhaps to satisfy doubts that the receive front end is really peaked up for maximum signal a 'Drive' control calibrated for each amateur band is brought out to the front panel. This operates a permeability system similar to that in the FT101 series transceivers and tunes the receiver front end and the low level transmitter stages. There is no doubt, it's a good feeling to peak this up and know everything is on the nose.

THE FT301D CIRCUIT

After looking at the technical features, we will now see just how it's all done. The FT301D is of single conversion design. With an IF frequency of 9 MHz the conversion scheme is rather like the FT202. The FT101 on the other hand is a double conversion design with a second IF and sideband filter at 3180 kHz. The receiver front end of the 301D uses the now almost standard 3SK40M dual gate FET as the RF amplifier and also as the first mixer. The IF amplifier section starts off with a ± 10 kHz monolithic filter which

helps to improve the receiver front end performance in such aspects as cross modulation. This is followed by two stages of amplification before the main filter section is reached. As mentioned before three filters can be installed and these are diode switched along with the function switch. Unfortunately, the FSK position on the function switch is not explained in the instruction book and it is not clear whether an RTTY filter is available, and if it can be installed. Our review sample had only the standard SSB filter installed and this was in circuit in all positions of the function switch.

The output of the VFO unit is premixed with the output of the heterodyne oscillator to produce the transmit frequency, or to convert the input frequency to the 9 MHz IF, on all bands except on 80 metres where the 5.5 MHz VFO is subtracted directly from the 9 MHz IF to produce 3.5 MHz. The crystal frequencies in the heterodyne oscillator range from 16 MHz for the 160 metre band to 44 MHz for the 29.5 MHz segment of the 10 metre band. An interesting feature of the audio section of the receiver is the inclusion of a top cut filter with a sharp cut-off above 2.6 kHz. This provides very clean audio with a complete absence of high frequency hiss.

The rejection filter works very much like the old single crystal filter common in communications receivers of the early post war years. A single crystal of about 9 MHz nominal frequency is series tuned with a small variable capacitor to vary its resonant point across the band pass of the transceiver. In all a very simple but effective idea. It's a wonder someone has not thought of it before. The idea should be adaptable to most existing transceivers.

A separate AM detector is provided, however it was unfortunate that the optional AM filter was not installed so that we could check out the AM performance.

While the transmitter circuitry is fairly conventional a few interesting design points are worthy of mention. The RF processor is designed to produce similar results to the one installed in the Yaesu FT101E. It is, however, operated at the 9 MHz IF frequency of the FT301D rather than 2180 kHz. A second 9 MHz filter is

included to remove the distortion products produced in the clipping process.

The 301D output stages consist of two broadband amplifiers in cascade. The output of the 10 watt driver stage is connected via a BNC coax fitting to the 100 watt final stage which is attached to the rear of the cabinet as a separate unit. The output of the final is routed back into the transceiver proper via a second BNC connector to the output filter section. If low power operation, or drive an external transverter is required, it is simply a matter of taking output from the appropriate BNC socket.

The digital display as fitted to the FT301D is set up to read the VFO frequency. The 5.0 to 5.5 MHz of the VFO is converted to 13.0 to 13.5 MHz which is the frequency at which the display counts. The MHz prefix for each band is produced by a diode matrix switched by the band switch. Although the display reads to 100Hz points the counter itself reads down to the 10 Hz points. This is to eliminate flicker which would otherwise occur on the last digit.

Front panel indicator lights sit between the dial readout and the 'S' meter show clarifier operation, and VFO or fixed channel selection.

THE FP301 POWER SUPPLY

This supply will be available in two versions. The FP301D also includes an LED digital clock which can be switched to give either a 12 or 24 hour readout. It also has an automatic CW identifier into which the owner's call sign can be programmed. As a sample of this supply was not available at the time this review was compiled we cannot comment on its operation.

The standard FP301 supply is capable of delivering 13.5 volts at a maximum current of 25 amps. The regulation from no output to 20 amps is better than 1/2 volt. A total of five transistors, four in the output, one driver plus one IC to provide overload protection, and a heavy duty diode bridge make up the solid state complement.

As Yaesu suggest this supply could be very handy around the shack to power other pieces of gear — even that old valve FM rig.

THE FT301D ON THE AIR

Setting up the 301 and getting on the air is a very simple procedure. The power input from either the AC power supply or the 12 volt DC source is via a 12 pin Jones socket on the rear of the transceiver. The antenna connector is a standard SO239. Yaesu supply a good quality push-to-talk dynamic microphone fitted with the now standard four pin screw-on connector. As soon as the power switch is closed the set comes instantly to life — both on transmit and receive. After providing a 50 ohm antenna, bands can be selected by simply setting the band switch and peaking the 'TUNE' control for maximum receiver output near the calibrated point for that particular band.

The main tuning control, which is a combination of gear and planetary drive, is extremely smooth. A finger hole is provided to fast tune from one band section to another and this is of adequate size to really spin the knob at a fast rate.

The digital readout is very clear and indicates frequency to the 100 Hz points. There are five digits on 80 and 40 metres and six digits on 20 metres and above. The actual size of the readout is 60 mm wide and 10 mm high. Tuning a transceiver with a digital readout takes getting used to. The initial tendency is to overshoot when aiming at a specific frequency and it takes quite a bit of practice to stop at a predetermined point.

Receiver performance is excellent. The fast-medium-slow AGC selection enables the correct amount of delay to be set to suit the strength of the incoming signal. For instance on 80 metres at night with a moderate static level and fairly strong signals, the slow AGC setting gives a marked increase in signal to noise ratio.

The receiver rejection filter was most effective in removing heterodynes of stations tuning up on or near the operating frequency. An interfering signal reading 20 dB over 'S'9 could be reduced to about 'S'3 and this amount of rejection remained much the same regardless of the actual beat frequency.

Receive audio through the speaker built into the matching power supply was very easy to listen to. The combination of very good AGC action, low distortion in the SSB detector and receiver audio section, and a well matched speaker all added up to much better than average results.

Transmitter tune up consists of advancing the 'DRIVE' control for a 10 amp reading on the meter, peaking the 'TUNE' control for maximum current and then further advancing the drive control for a 15 amp reading. So long as the final is properly matched this reading will indicate a full 200 watts input.

We checked the actual power output on each band with a Swan WM-1500 power meter and the FT301D connected to a Heath Antenna 50 ohm dummy load. A Heath SB610 monitor scope was also in circuit to determine the PEP output. The following results were obtained.

BAND	RMS OUTPUT	PEP OUTPUT
160	100 watts	100 watts
80	110 watts	120 watts
40	150 watts	150 watts
20	75 watts	75 watts
15	125 watts	120 watts
15	100 watts	125 watts

No reason could be determined for the slightly lower output on 20 metres but the difference is small in practice. The output wave form on the scope was true copy book style in both the CW and SSB modes. In fact the CW carrier pattern was the cleanest of any transmitter so far tested.

It appeared that the transmitter could be run at full input in the CW mode almost indefinitely. After several minutes of such operation the heat sink of the transmitter

was only moderately hot but the power supply heat sink was very hot and could represent a hazard to unsuspecting people if in an exposed position. Under normal SSB operation it did not get quite as hot but after a lengthy period with continual use of the RF processor, the temperature built up to quite a high degree.

The action of the processor was quite satisfactory and appeared to produce about 20 dB of clipping. No panel control was provided for adjustment of the clipping level. In use on the air it produced results similar to clippers reviewed earlier this year.

On air reports of the transmitted audio quality were all most satisfactory and in all cases a great deal of interest was expressed in the unit.

VOX operation was quite smooth and an adequate degree of adjustment was provided on the delay and anti-trip controls to enable the most critical VOX enthusiasts to set them to his liking. Mechanical noise from the relays was moderately high but no electrical clicks or pops were audible. The VOX was also satisfactory for CW operation however the delay required for this mode is usually much shorter and it is necessary to remove the transceiver lid and reach through a small hole with a fine screwdriver to make the change. The microphone gain control is also an internal preset. It is however provided with a plastic shaft to make adjustment easier.

The front panel controls are a mixture of good and bad so far as operation is concerned. The bad points were mostly covered in the review of the FT221 and unfortunately persist in the 301D. Although the lamp illuminating the meter has been increased in output, the scale is still hard to read. A return to the translucent type scale with rear illumination as used on the FT220 series is badly needed.

The panel knobs have no white indicator to show which way they point. Admittedly there is a small raised moulding but it is easy to miss this when the control is gripped in the normal way.

VFO stability was checked and found to easily meet the specified 100 Hz per half hour drift for the first half was almost exactly 100 Hz, and over the next hour and a half did not exceed 150 Hz. However, over the same period of time, the digital readout shifted 800 Hz. An interesting case where the VFO is more stable than the frequency counter.

Calibration of the dial to the marker oscillator was a little different to setting a normal type dial. The transceiver was tuned to zero beat and then the 'Calibrate' control adjusted to bring the readout to the zero point. As no offset shift is provided on the VFO with change of sideband, it is necessary to recalibrate when changing from upper to lower sideband. When the offset tuning is adjusted however the readout changes accordingly, you only have to remember what it was before.

Another unfortunate carry-over from the FT221 is the use of miniature 3.5 mm

"Antenna" Dummy Load

1 kW max input, 1.5-300 MHz w/SWR 1.5:1 or less. Oil not incl
Kit HN-31, \$28.50

Heathkit Coax Switch

Switches on RF source to any one of several antennas or loads, unused outputs grounded. Use two to switch up to four different transmitters, receivers, etc. 1:1 max SWR to 250 MHz. 2 kW PEP max power rating.

Kit HD-1234, \$20.75

Heathkit HF Wattmeter/SWR Bridge

Remote detector permits placement of meter in any convenient location... 6 ft. of cable supplied

Kit HM-102, \$51.20

HM-102 SPECIFICATIONS - Frequency range: 1.5 to 30 MHz. Wattmeter accuracy: $\pm 10\%$ of full-scale reading. Power capability: 10 to 2000 watts. Impedance: 50 ohm nominal. Connectors: UHF type SO-239. Dimensions: $5\frac{1}{2}'' \times 5\frac{1}{2}'' \times 4\frac{1}{2}''$ H x 640° D

Heathkit VHF Wattmeter/SWR Bridge

Kit HM-2102, \$51.20

HM-2102 SPECIFICATIONS - Frequency range: 50 MHz to 150 MHz. Wattmeter accuracy: $\pm 10\%$ of full-scale. Power capability: To 250 W. SWR sensitivity: Less than 10 W impedance: 50 ohm nominal. SWR bridge: Continuous to 250. Connectors: UHF type SO-239. Dimensions: $5\frac{1}{2}'' \times 5\frac{1}{2}'' \times 4\frac{1}{2}''$ H and 640° D, assembled as one unit. Using a 50 Ω noninductive load

Heathkit HP-23B Fixed-Station Supply

Power requirements: 120/240 VAC, 60/50 Hz. 250 watts maximum. High voltage output: 320 VDC no load; 700 VDC @ 200 mA $\pm 10\%$ AC ripple. Less than 1% @ 250 mA. Duty cycle: 150 mA continuous to 200 mA @ 50%. Low voltage output (High tap): 350 VDC no load; 300 VDC @ 150 mA $\pm 10\%$ (Low tap) 275 VDC no load; 250 VDC @ 100 mA $\pm 10\%$. Less than 5% AC ripple @ 150 mA, continuous duty to 175 mA. Fixed bias: -130 VDC $\pm 10\%$ no load; -150 VDC @ 20 mA. Filament voltage: 12.6 VDC @ 5.5 amps. Dimensions: $9'' \times 4\frac{1}{2}'' \times 6\frac{1}{4}''$ H

Kit HP-23B, \$98.50

New Heathkit solid-state Dip Meter

Another Heath value triumph — a better dip meter at lower cost. The Colpitts oscillator covers 1.6 to 250 MHz in fundamentals with a MOS-FET paraphase amplifier and hot-carrier diodes for more sensitivity and a better dip. It uses a Q-multiplier for greater detector sensitivity and a responsive 150 μ A meter movement for positive resonance indications. It includes a phone jack for modulation monitoring. It's smaller and lighter than others, too. Completely portable. Whether you're checking resonant frequencies, adjusting traps, looking for parasites, or using it as a signal generator the HD-1250 is designed to go anywhere. It fits your hand and thanks to its solid-state design and 9-volt battery operation, it's ready to use instantly wherever you are. The custom molded gray carrying case protects the meter and the 7 color-coded, pre-adjusted, plug-in coils in transit, and makes a handy storage place.

Kit HD-1250, \$89.00

Heathkit Code Practice Oscillator

As much fun to build as it is to use — and it makes a great starter kit for a beginning CW operator. The molded plastic cabinet with dark green front panel matches Heathkit "SB" series gear.

Safe, portable and reliable, the HD-1416 is designed in the Heath tradition of top quality and value. Most components mount on a single circuit board for easy assembly. The unit operates from a single inexpensive 9-volt transistor battery (not supplied) and comes complete with telegraph key and phone jack. The oscillator, with built-in speaker, has a separate control for volume on the front panel — as well as a tone control accessible from the back of the cabinet. The HD-1416 can also be used as a side tone oscillator with any transmitter using grid block keying — such as the Heathkit DX-605.

Kit HD-1416, \$20.00

HD-1416 SPECIFICATIONS

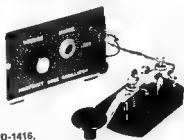
Mode of Operation: Speaker or headphones. Tone Frequency: 200-800 Hz adjustable. Battery Required: 9-volt transistor battery equivalent. Needs 91504 (not supplied). Speaker: 45 ohms. Headphones: 8-2000 ohms. Side-tone Oscillator: Grid block keying transmitters (400 volts DC, negative maximum). Controls: Volume, Tone (internal). Front Panel Connections: Key, Phone jack. Transistors: (2) MPS420, (1) 2N5245. Color: White grey and dark green.



HN-31



HD-1250,



HD-1416,

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P/Code

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PAL 69 AM, SSB 15-Watt PEP 23 channels **\$210**

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SINGLE METER with power scale 10-100 W **\$17**

TWIN METER, SWR up to 200 MHz **\$22**

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For KP-202

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TH3MK3 10-15-20 M 3-element Yagi 14' boom **\$180**

TH6DXX 10-15-20 M 6-element Yagi 24' boom **\$225**

TIGER ARRAY 204 BA 20 M 4-element 26' boom **\$190**

BN-86 balun **\$18**

ASAHI MOBILE ANTENNAS

AS-2-DW-E $\frac{1}{2}$ wave 2 M mobile whip **\$8**

AS-WW $\frac{1}{2}$ wave 2 M mobile whip **\$18**

AS-GM gutter clip mount with cable and connectors **\$10**

M-Ring body mount and cap **\$5**

CUSH CRAFT ANTENNAS

CR-2X Ringo Ranger double $\frac{1}{2}$ vertical for 2 M **\$37**

A147-11 11-element 2 M Yagi **\$37**

A147-20 combination horizontal vertical 2 M **\$85**

A144-20 combination Yagi with matching harness for circular polarization **\$85**

ANTENNA ROTATORS

Model CDR Ham-II for all hf beams except 40 M **\$165**

Model CDR AR-22 L junior rotator for small beams **\$55**

KEN model **KR-400** for all medium-size hf beams with internal disc brake **\$100**

KEN model **KR-500** for vertical elevation control of satellite tracking **\$100**

All models rotators come complete with 230-volt AC indicator-control units.

6-conductor cable for **KR-400-500** **65 cents per metre**

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Coax connectors, **RG-8** and **RG-58** type. Male to male and female joiners **All for \$1**

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Please add cutting and handling cost—**\$1**.

DRAKE W-4 SWR Watt-meter, **0-200** and **0-2000** Watt scales **\$60**

DRAKE TV-1000 TVI low pass filter **\$25**

DRAKE TV-3300 TVI low pass filter **\$28**

DRAKE TV-42 TVI low pass filter, low power **\$15**

DRAKE MN-2000 matching network **\$230**

DRAKE MN-4 low power ant. tuner **\$115**

All prices quoted are net SYDNEY, N.S.W., on cash-with-order basis, sales tax included in all cases, but subject to changes without prior notice. ALL-RISK INSURANCE from now on free with all orders over \$100; small orders add 50c for insurance. Allow for freight, postage or carriage; excess remitted will be refunded. For prompt and economical despatch we use ANSETT air freight and COMET road service.

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PETER SCHULZ, VK2ZXL.

high output is put into the audio keyer. You will see many multimeters with diodes placed across their terminals. These are usually silicon diodes with a turn on voltage of 0.5 to 0.7 volts whilst the meter may well have a FSD sensitivity of 0.1 volts drop across it. The meter will suffer a 5 to 7 times FSD overload before the diodes have any effect. It is rather doubtful in some cases whether in fact the protection diodes are any real value. The meter in the audio Morse keyer, as you

DIODE CHARACTERISTICS

Type No.	Type	Volts drop at 0.3 mA	Volts drop at 30 mA
EM404	Silicon	0.5V	0.7V
OA5	Ger.	0.15V	0.4V
GEX66	Ger.	0.16V	0.85V
OA91	Ger.	0.22V	1.00V

can see, is fully protected against overload.

I hope that you have found this little excursion into some of the rarely exploited

features of silicon and germanium diodes of interest, each type having its own particular points. — VK3UG.

VHF-UHF AN EXPANDING WORLD

Eric Jamieson, VK5LP
Forreston, 8233

AMATEUR BAND BEACONS

VK6	VK6MA, Mawson	53,100
VK6	VK6GR, Casey	53,200
VK1	VK1RTA, Canberra	146,475
VK2	VK2WI, Sydney	52,450
VK3	VK3WI, Sydney	144,010
VK3	VK3RTG, Vermont	144,700
VK4	VK4RTL, Townsville	52,600
VK4	VK4RTT, Mt. Mowbrall	144,400
VK5	VK5VF, Mt. Lofy	53,600
VK5	VK5VF, Mt. Lofy	144,800
VK6	VK6RTV, Perth	52,300
VK6	VK6RTU, Kelsoville	52,350
VK6	VK6RTW, Albany	52,950
VK6	VK6RTW, Albany	144,500
VK6	VK6RTV, Perth	145,000
VK7	VK7RMT, Launceston	52,490
VK7	VK7RTX, Devonport	144,590
VK7	VK7RTW, Leneh	52,475
VK6	VK6VF, Darwin	52,200
3D	3D3AA, Suva, Fiji	52,590
JA	JA1YAA, Japan	58,110
HL	HLBWJ, South Korea*	58,110
K0	K0BKC, USA	58,110
KH8	KH8GJ, Hawaii	58,104
ZL1	ZL1VHF, Auckland	145,190
ZL2	ZL2MHF, Upper Hutt	28,270
ZL2	ZL2VHP, Palmerston North	52,590
ZL2	ZL2VHF, Wellington	145,200
ZL2	ZL2VHP, Palmerston North	145,250
ZL3	ZL3VHF, Christchurch	145,390
ZL4	ZL4VHF, Dunedin	145,400

SIX METRE OPENS . . .

And how Saturday 23/10/76 . . . the day of the sun eclipse will be remembered in several ways. Journeyed 250 miles to the south-east of VK5 and from my position at Southland, a little seaport on the coast of New Guinea was fortunate to enjoy many breaks in the cloud cover to allow SS colour slides to be taken of the eclipse — these are now being processed so hopefully some will be OK. Of course things do happen on the few occasions I leave my premises, and this time it happened in a really big way. First news of a coming special came in a phone call from VK7JV who advised that on 23/10 a six metres opened to VK4 during the morning. At 0200Z John heard a VK4 call sign answered him, and back came a VK4. After working him the VK4 was gone, but on tuning the band more JA stations were heard.

For a period of an hour JA stations were seen, as a Tasmanian, a total of 16 were worked. John VK7JV worked B, Joe VK7JG (FZGJ) and Kevin VK7ZAH each 5 Signals varied from S4 to S8. Distances available were JA1, JE1, 2 and 3 JH2 -JH3 and JF3. They heard JH1-EUC working a VK3, so they knew the VK3 boys were in on it too.

Many thanks for the news John the promptness of advice in Tasmania much appreciated. I also thank Joe VK7JG who phoned to advise of the correctness of the call sign for the six metre beacon in Northern Tasmania. I had been listing

it as VK7RMT instead of VK7RMT, the correction as now in effect.

Well that phone call from VK7JV started me almost wishing I had stayed away from the eclipse, but then a day or so later in rolled a bulging envelope from Steve VK3BZ in Melbourne, crammed full of news of the opening on that Saturday. The best I can do is to largely give you the news as it came to me as it is all so interesting, and will have a lot of mouths watering before the reading is finished. I am much indebted to you Steve for the constant information you feed me, and this one being so special will be appreciated by all the DX gang.

Steve writes "What a fantastic 6 metre day 23/10/76. Commencing 0212Z VK4 were worked from Melbourne to Brisbane and up to Ingham areas. Whilst working 10 metres VK4GI came up calling CQ on 6 metres at 0358Z. I was in contact with UA0LBU on 10 metres at the time. I called VK4GI just to say hello. I was still in QSO with UA0LBU, and suddenly bang! A huge signal came up over the top of VK4GI signing JH6JUN, then JH1EUC 5 x 9-1-1. I signed with the Russian station after relating the JA's back over 10 metres showing him the strength. The following areas were worked:

0400-0432 JA1 — All Prefectures.
0432-0439 JA2 — Three Prefectures.
0439-0443 JA3 — Oshana.
0443-0447 JA4 — Oshana.
0449 JA5 — Kagawa
0449-0452 JA0 — 2 Prefectures
0500 JH6 — Fukutsu.
Heard were JA7, but no JA8 or JA9
0530 JH8 — Okinawa Island

No HL8WV beacon, plenty of JA's on 50.150. Television birds all around 90 MHz peaking north. 0451 — JRC00Z 5 x 5 worked
0505-0515 CW CQ from VK3BZ QZC call to 7ADCC? Called JA0CC
Response in CW QSY QSY QSY I moved to 52.010 Called JA0CC?
Response QSY down 20. I moved to 52.000. Called QZC JA0CC? No response.
Tuned down to 51.990 and heard VK3BZ VK3BZ of UA0CCW K.

I offset clarifier, gave 569 RST at least 10 times and QTH.

Response VK3BZ of UA0CCY 569 UR RST name Vlad OTH . . . noise etc QSB. More tries same results noise etc.

6521 UA0CCW K of VK3BZ

Response SB SBY QSB . . . noise then VK3BZ of RA0CCM RA0CCM K

Response RA0CCM ? ? VK3BZ RST 539 539 K.

Response VK3BZ of RA0CCM name Victor OTH Khe . . . vk . . . ? . . . noise QSB

Me R R R RA0CCM of VK3BZ RST 539 name Victor etc.

Response R R R VK3BZ of RA0CCM RST 539 Steve OK OK K.

Me R R R Victor OM TU FB QSO PSE QSL via BURO PSE K K.

Response R R R 73 73 VK3BZ . . . noise etc. of RA0CCM K.

Me R R R 73 73 of Melbourne, Australia etc.

Need I say any more?

A contact with JH6JAY on 52.001 but signals QSB into noise, and all TV birds disappeared by 0600Z. I then moved to 10 metres and worked many more JA stations.

Following is some Russian VHF information UA0CCA to UA0CCZ indicates a class of licence, full class up to 500 watts.

RA0CCA to RA0CCZ indicates a technique or novice type licence to 50 watts.

Location on City of Khabarovsk 800 miles NNE of Vladivostok Postal Code of Box 024, Vladivostok 10. Soviet Russia.

Six metres allocation on a Club basis only 50 to 52 MHz. VHF Propagat on studies. Antenna. Some loss of antenna current area. 500 watts output from some sort of Government transmitter, modes FM, CW or AM, no SSB.

Two metres Allocation 144-148 MHz FM, CW or AM, no SSB. Power output 200 watts. Antenna 10 element yagi, w/ 15 element proposed. JAD-4 Worked on 2 metres 100 July to September 1976, as a Weather Radio on 2 metres.

In future suggested procedure call on 52.600 SSB for responses and nominate 52 MHz frequency. For those with transceiver, use your 2 meter with 10 kHz offset, transmit on 52.005 and listen 51.995.

Stations worked during the opening VK3BZ 2 JA, VK3AKK 11, VK3AMK 6, VK32PY VK3ZBJ each 5 etc etc

STOP PRESS: ZL1VHF beacon copied on 145.100 by K6QJ/KH6 last week.

Again, many thanks Steve for that interesting run down. This will certainly help to keep six metres more alive this year, and I hope we may not have to always wait for the sunset before we can hear the long distance DX. With better equipment and probably with more people able to be around with spare time such contacts may become more common. However, once again it demonstrates the disadvantages we are facing by our 2 MHz allocation above the world wide standard of 50 to 52 MHz. With the case of the Russian stations, they cannot come up into our segment and we cannot go down into theirs, which means at such activity has to be crammed into a few kHz at the band edge.

GENERAL NEWS

Peter VK4APR writes to advise of a message received on 20 metres the JA A064Z on Guam operates a beacon from 0800 to 1000Z on 52.050 with 250 watts to a 4 element yagi pointed at Australia. The beacon a CW aging 'CQ call sign Guam' then listening period before keying again. Joe monitors frequency during breaks. Many thanks Peter.

I have also received a letter from Mike call sign not remembered, who is now living in Ceduna in ex-VK55S territory. Mike advises being able to operate on 8 metres SSB with an FTV650 and FT200 to a 5 element yagi 50 feet and on 2 metres SSB with an ICR207 with 3 watts at present but eventually 300 watts, to a 9 ft yagi at 60 feet. He is building a AC2265B 1 meter but with the usual problems on some parts. Part are to eventually produce the A064Z of Ceduna, 8 repeater. Mike will be somewhat irritated for time to operate and indicates therefore the Ross Hui Contest will not be in jeopardy from there for the time being.

Anyway, it's good to hear that activity is continuing on VHF from Ceduna, and both the VK5 and VK6 boys will be interested to have some (I hope) particularly when you have 300 watts on 144 MHz SSB.

MOONBOUNCE REPORT

From Lyle VK2ZAL and "The Propagator" comes the monthly EME report which mentions that the scheduled moonbounce tests were carried out on the morning of 28/5 with WSLD, who was not alone, and WSLA, who transmitted he was hearing VK2AMW at "R" copy. We heard he agreed to VK2AMW at the test period and they came up to 5 dB above noise on his last transmission.

This allowed copy of full call signs but the test period ran out before a contact could be made.

Letters were received from KXPGR and W4XZ1 before the test weekend, requesting tests with each other during the hour immediately prior to the scheduled tests. However, moonrise was such that our lowbaw 6 ft test transmits (time was only 15 minutes before the start of the scheduled tests. Both stations were called but no replies heard. Our ecbos peaked to 9 dB above noise during its best period. S/N ratio was checked at 13 dB above sky noise.

A further series of scheduled tests were carried out during the evening of 26/8 with European stations. QZOP was called but no replies heard. W4XZ1 was heard calling us and he was acknowledged, but another European station came on frequency during the last part of the test period and blotted him out.

The last half hour of the test periods was scheduled as a QO period for VK3AMW. We were called by LX10B in Luxembourg, who gave us 'O' reports (good signal strength). His signals peaked at 7 dB above noise and we were able to copy full calls without difficulty. Reports were acknowledged both ways for the first Australia-Luxembourg QO contact.

'Noise signal' emanation from the stars at the Galactic center was checked at better than 25 dB above cold sky noise. This information is now being evaluated to provide antenna gain - receiving system noise figure relationships which can be correlated with our noise measurements and cold sky 50 ohm pulse termination resistor noise signal (dB).

VK3ZEN and VK3ALU carried out the September tests.

Also on the moonbounce scene this time we have some news from Chris VK3MAG and his 144

MHz EMC efforts thanks to the pages of "The Blurp" Chris writes:

"Over the past couple of months my windows for moonbounce have been troubled by the sun being in the same part of the sky as the moon. But they have now started to separate once more and the clouds are being chased."

"21/7/76 13Z8Z After repeating an isolating relay the night before, I found that no echoes were being received at the centre time. Quickly climbing the food tower, and using a match to wedge closed the suspect relay so that I could receive, I turned the band and immediately heard KB11. I took the chance of blowing my prepamp and called him, and was rewarded with an 'O' report and 349 RST. I later received a QSL card from him with a note from which I quote 'My array of 32 yagis has been down due to ice since March, all I have now is 8 x 14 element KLM's. Men, who do moonbounce! Most people are lucky to have 35 elements! Well, mine's 32 yagis! 24/7/76 . . . heard WAYBU and W4ZAL having contact - also heard KB11 calling me, but no contacts resulted. 25/7/76 . . . worked a new one K9WAB. Report sent 439, received 'O' report. 'A first noise of interest. I have heard 3 dB of excess noise from the Milky Way. This morning measured 17 dB of sun noise. More later'."

Thanks Chris for the report, would like to hear of some of your later exploits.

OUR LETTERS
From time to time I receive requests from some writers for news of ATV activity. I will be glad to pass on such information through this column if it is sent to me, but it must be years since anyone has written saying what they are doing. Sorry guys who are waiting for information, I cannot help you at the moment, but perhaps this plea will bring something of regular results.

Well, the summer DX season is with us now, and by the time you read these notes perhaps some exotic contacts have been made. While 6 metres seems to have a lot of glamour at this time, don't overlook the 2 metre band. Lots of things can happen there. Peak time for long distance DX there seems to be towards Christmas so be on the lookout! Once the sporadic E type of 2 metre transmissions have disappeared keep in mind the ducting and rivers on top contacts particularly along the southern coastline. It has been possible to work from 13 dB and VK3 into Albany around January and February for several years now and 1977 may be the same.

As the Christmas season approaches may I take the space to wish everyone a very happy Christmas and a Prosperous New Year. I would like to thank everyone who has written to me during the past year giving me news and information for the column - it's pretty hard to keep it going sometimes, but I do the best I can. My thanks also to those various Clubs, and there are many, who continually forward me copies of their newsletters and publications, use from them whenever I can which is of overall interest. Special thanks to Mac ZL2KQ who keeps my subscription going to "Break in" in return for which I make sure he gets AR. Ladd but not least my thanks and best wishes to The Editor for his co-operation and tolerance of me, and the lack of complaints which seems to be the safest one.

With all those special thoughts for the time of the year, I would like to close with a special thought for the month: May all your troubles during the coming year be as shortlived as your New Year's Resolutions! And Woman, examining diamond brooch, to jewelery salesman "In looking for a Christmas gift for a husband who got me an outdoor motor last year!"
73 The Voice in the H is

IARU NEWS

Mr. Owen reported on return from his overseas journeys that the presentation shield he handed over to IARL on behalf of the WIA was very well received. Greetings to IARL on their 50th anniversary, from many amateur societies, were included in a well-produced booklet specially produced for the occasion.

WARC 78

The Federal President attended the 3rd meeting of the APG on 8th October and reported that discussions centred mainly on administrative matters. The next meeting scheduled for early in 1977 would deal with preliminary nitty-gritty details affecting the frequency spectrum in Australia.

During October the WIA voted in favour of the admission of the Radio Amateurs' Society of Thailand to the IARU, Region 3 Association.

A letter was received from the Secretary/Treasurer of the PNG Amateur Radio Society advising that a Constitution for this Society has been agreed and recruiting for members was being undertaken. The writer was Gey N. W3JW and the editor was John Baker K229B was the President. This will be a most useful addition to amateur radio in Region 3 and deserves full support. The Society's address is P.O. Box 204, Port Moresby.

KV3ND, the Assistant General Manager of the AIRL.

Two and a half days were devoted to the preparation of a model position paper to assist the smaller societies in appraising their governments of the legitimate requirements of the Amateur for frequencies through to the year 2000.

The International Working Group is making two significant recommendations to the Regional organisations. The first recommendation relates to the 40 metre band. It is the global position of the Amateur Service to seek expansion of that band. In Region 3 the frequency 7-7190 is presently allocated to the Amateur Service. At the conference in Hong Kong the Region 3 Association adopted a policy of seeking expansion of that band "upwards". Recognising the claims by the broadcasting service to frequencies on the high frequency side of the existing 40 metre band, the International Working Group has recommended a policy to seek expansion of the existing 40 metre band both above and below the existing allocation.

The other important recommendation made by the International Working Group relates to a preference for the frequency band 155-160 GHz instead of the previous recommendation of 165-170 GHz for the Amateur Service and Amateur Satellite Service. This change results from a recognition of the fact that the latter frequency band suffers from high absorption by water vapour and would be useless for terrestrial communication purposes.

The Secretary of the Region 1 Division, Roy Stevens, undertook final editing of these papers which will be printed and circulated to the regional organisations. The Directors of the Region 3 Association will also be considering the adoption of these documents and then will attend to circulation of copies to the member societies of Region 3.

The members of the International Working Group also attended a reception held at the ITU and met delegates attending the Frequency Management Spectrum Seminar being conducted under the auspices of the International Frequency Registration Board, members of the International Amateur Radio Club and officials of the International Telecommunications Union. In addition, a meeting was held with the President of Desamais, Emileurs, Francaise (IEF), the Amateur M. J. Couvel, RFF and other officers of REF.

Michael S. Owen VK3KI.

20 YEARS AGO

Ron Fisher, VK3OM

DECEMBER 1956

What were the aims of the Institute twenty years ago? The Editorial page of December 1956 Amateur Radio stated these aims which might be worth repeating.

To act as the voice of the Amateur in public discussions.

To assist the investigator on communication problems.

To conduct educational work.

To provide a medium for exchange of ideas and to publish a journal.

To promote friendship between experimenters.

The Editors then went on to suggest that we all should endeavour to encourage some young enthusiasts. If this was important twenty years ago it is even more important today. With so many young people turning to illegal operation on the 27 MHz band, we must make every effort to encourage them in the right direction.

Another Two-Way Converter Bob Winch VK2OA described his new design that produced a fantastic 5 dB noise figure when first turned on. The RF used was a BAK5 E31 cascade to a BAK5 mixer.

Clamp tube modulation was popular in the 1950s. Most people who had the famous type 3 mark 2 transceiver probably tried this system of modulation at one time or another. F. Brice VK5OK described two different ways of doing it.

The 1956 Remembrance Day results gave a win to Western Australia. Top scorers in each State were VK2AMR, VK3ATH, VK4GC, VK5EN, VK6FD, VK7AI and VK8B.

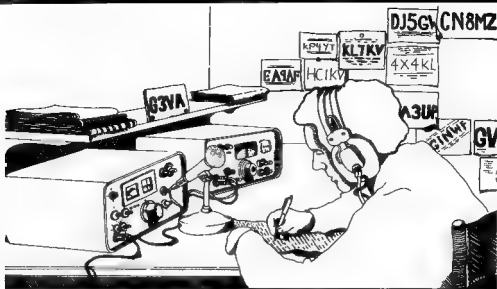
Federal notes column advise that the VK1 prefix has been allocated to the Federal Capital Territory and that Antarctica, previously VK1 would become VK0.

IARU INTERNATIONAL WORKING GROUP MEETS IN GENEVA

The "International Working Group" convened by the President of the International Amateur Radio League, Noel Eaton VE3CJ met in Geneva from the 17th to the 20th September, 1976.

Members of this Working Group included Roy Stevens, G3EYV, the Secretary of the IARU Region 1 Division, Michael Owen, VK3KI, a Director of the IARU Region 3 Association and Vic Clark, W4KFC, the President of the International Amateur Radio Club on Region 2 Division. Also present were "Tim" Hughes, G3GVV and David Sumner,

How many New Members have YOU introduced this MONTH?



Newnes Technical Books

for the Ham

RADIO VALVE AND SEMICONDUCTOR DATA

10th Edition, by A. M. Ball

179 pages 257 mm x 210 mm 1975

'... Inspection of the book suggests that the data is a good deal more comprehensive and carefully set out than in many other publications we have seen.'

ELECTRONICS AUSTRALIA

NEWNES RADIO ENGINEER'S POCKET BOOK

14th Edition, edited by P. Lafferty

192 pages 76 mm x 124 mm 1974

An invaluable compendium of radio facts, figures and formulae, indispensable to the designer, student, service engineer, and all concerned in the radio industry. New tables include radio and television frequencies and channels and information on metric wire sizes.

GUIDE TO BROADCASTING STATIONS

17th Edition, material supplied by BBC Tatsfield Receiving Station.

176 pages 190 mm x 127 mm illustrated 1973

This seventeenth edition of a title which has sold more than 250,000 copies contains useful fundamental information on radio receivers, aeriels and earths, propagation, signal identification and reception reports in the chapters at the front.

FOUNDATION OF WIRELESS AND ELECTRONICS

9th Edition, by M. G. Scroggie

552 pages 215 mm x 135 mm 1975

'... The 9th edition is much larger than the earlier versions and it indeed needs to be to cover, as it does, the whole gamut from fundamentals, to modern technology.

'... In fact, the contents list is 9 pages long and is itself, a most useful feature of a very comprehensive and useful textbook. Highly recommended.'

ELECTRONICS AUSTRALIA

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BOOK OR COMPONENT SHOP**

1976 REMEMBRANCE DAY CONTEST RESULTS

	a	b	c	d	e	f
VK5 & VK8	227	848	26.8	1578	65590	19137
VK4	210	819	25.8	1829	57798	16648
VK6	77	522	14.8	962	22563	4306
VK7 & VK0	41	243	16.9	1093	13451	3359
VK2	111	2226	6	1563	30054	2862
VK3	97	2135	4.5	1092	31467	2932
VK1	22	131	16.8	800	7866	2121

a—Logs rece ved

b—L1 catches

c—% participation

d—Average top 6 logs

e—Total score

f—Trophy score

DIVISIONAL SECTION LEADERS SCORES ARE SUBJECT TO FURTHER CHECKS

In the following detailed scores the first figures are the per cent scores and the second are contacts made.

VK1	Phone	Score	Per cent	Score	Per cent
ACA	721 551	MF	287 149	YR	79 79
VP	705 302	LF	280 119	ZM	66 66
AC	624 325	BH	163 51	ZPB	45 45
W	592 295	OB	177 82	WT	12 12
W	344 172	ZAR	152 132	RY	8 8
ZT	324 183	ZJJ	123 123	PM	7 7

CW	Score	Per cent
VK	418 79	

Open	Score	Per cent
DC	1073 482	AOP 1050 457 DA 826 302

VK2	Phone	Score	Per cent	Score	Per cent
BYC	1541 585	BOW	183 84	ZBO	81 81
BT	1147 407	CH	177 77	AWX/2	80 80
BOT	918 339	WT	162 67	CD	48 48
AGF	911 310	BZ	158 84	AIB	44 44
NW	780 321	CM	150 87	ZKO	44 44
RW	753 300	AXU	143 86	ZVN	40 40
BDN	690 285	BRU	131 42	JF	38 38
ACV	603 255	CAF	129 80	VE	36 36
AJY	603 266	NF	137 51	BCD	36 36
ASY	520 240	BSG	127 50	IE	29 29
ADZ	367 181	AYL	124 89	ZUR	29 29
ALZ	347 120	PT	123 34	OH	28 8
R	345 188	ASG	122 37	SR	28 10
AJH	334 107	NI	108 35	WD	26 14
	324 141	PN	105 32	NY	24 24
	321 133	ASH	105 31	YEC	23 23
BMX	306 120	BTX	102 43	ZAX	21 21
PF	302 102	AUK	101 42	JF	18 14
BZJ	284 114	NO	100 100	AJQ/M	18 18
CW	255 82	MR	100 46	ZGK	16 16
BAX	245 124	UJ	82 41	AKH	14 10
AO	227 89	ADL	87 30	ZID	14 14
FJ	203 105	RX	84 54	ZTM	14 14
BDN	192 100	BJN	81 31	YEC	12 12
AIM	210 150	ZCT	81 81	BSC	10 10
DAM	209 50	HZ	66 19	AND	7 7
FM	203 75	EY	64 25	BDC	7 7
ABC	193 58	GS	61 22	SW	6 6
BFG	187 85	BJK	57 34		

AGF	911 310	BZ	158 84	AIB	44 29
NW	760 321	CM	150 87	ZKQ	44 44
RW	753 300	AXU	143 86	ZVN	40 40
BDN	690 298	BRU	137 50	CF	38 17
AHV	603 255	CAF	130 80	LE	36 20
AJY	603 266	NF	127 51	BAO	36 36
ASY	520 240	BSG	127 50	IE	29 29
ADZ	367 181	AYL	124 69	ZUR	29 29
ALZ	347 120	PT	123 34	OH	28 8
RP	345 188	ASG	122 37	SR	28 10

CW	Score	Per cent
DL	1342 223	XQ 614 116 ADR 200 48
DT	1134 204	GT 492 91 IR 184 33
AGS	848 148	JY 314 70 RW 156 35
GR	790 153	VM 314 55 GW 72 14
BHO	656 147	NAG 242 61 RJ 38 11

Open	Score	Per cent
CAX	1842 520	BYV 227 136 AAC 109 56
BO	1370 417	BLK 167 103 BCU 71 32
AOA	600 268	BCK 179 49
GO	509 145	GS 169 71

CONTESTS

Kevin Phillips, VK3AUQ
Box 57, East Melbourne, 3002

VK3	Phone	Score	Per cent	Score	Per cent
HT	1103 028	BPN	338 181	YAF	73 74
ATF	1032 358	EP	328 145	ALP	68 21
WP	891 471	XF	322 158	AJP	67 23
ADW	889 424	ZWM	308 208	ZDJ	67 67
BIZ	848 448	BA	305 107	BER	63 34
AMK	792 388	KK	290 120	YBE	62 36
AQZ	785 413	LV	289 105	ZNH	60 60
YO	708 334	RU	235 65	ZKD	58 58
CK	705 413	ZJ	231 110	ZDN/P	58 58
SM	698 333	QJ	217 97	NV	52 31
DF	682 473	AFU	191 92	OD	52 43
GX	687 404	PW	160 61	RF	48 24
AKK	621 467	WJ	157 88	OB	41 20
LM	545 211	WM	157 78	KT	40 42
LP	501 229	AIE	143 65	WY	35 30
ZI	501 318	YIE	138 138	APJ	34 31
YQ	482 178	YH	131 47	ZVZ	30 30
AIZ	400 196	BFA	113 62	ARA	25 9
BBH	416 207	AHG	105 51	ADL	23 7
BHU	394 222	AXV	101 53	QL	21 15
ASN	362 187	HE	97 31	YHV	19 19
DB	364 167	AAJ	97 48	BZC	11 9
BLH	350 173	ARS	95 98	ZLN	11 11
ZD	344 165	VQ	75 30		

CW	Score	Per cent
OP	952 233	XU/3 454 111 IQ 100 38
CM	734 187	XB 358 91 KB 36 10
CG	638 156	JJ 312 82 AZT 36 11
DG	576 145	UV 150 37 ACV 34 9
RJ	484 108	BON 132 35
YK	480 111	NK 114 26

Open	Score	Per cent
AM	1689 913	GI 358 138 AMD 258 84
ALZ	734 288	AYL 265 158 VF 253 105
WF	648 332	PR 292 111
YY	683 148	AUQ 264 108

VK4	Phone	Score	Per cent	Score	Per cent
ZQ	2184 961	ZRF	328 333	SQ	117 91
AM	1893 663	PN	323 154	NDJ	111 111
VU	1519 628	FX	321 102	MA	109 109
UV	1358 618	UJ	267 70	BF	108 40
AM	1274 517	PJ	268 117	UM	106 24
LP	1045 328	ZBV	235 234	PJ	106 87
DO	1018 358	NO	234 80	SAN/A	107 67
AO	964 288	ZMG	234 234	ALM	104 39
MR	926 311	JO	227 177	ZGJ	103 104
OW	928 615	CW	221 102	ZAL	106 103
LE	843 133	ACM	162 50	AKK	87 32
KW	878 335	OE	215 103	ZGE	100 100
TE	842 400	NIC	209 83	AL/A	96 36
EQ	828 374	ZNI	200 200	SR	96 82
AYM	717 342	PS	197 71	HJ	96 37
AAH	615 287	GS	185 86	BS	95 31
ABJ	577 238	ZRQ	185 185	ARB	94 37
ADC	532 258	QC	183 84	AMO/A	92 31
MM	526 209	XZ	182 123	EN	91 81
AAU	484 150	HB	178 50	YJ	90 30
AAU	470 221	ZHW	175 170	SH/A	89 31
LE	443 133	ACM	162 50	AKK	87 32
ZSH	427 432	CY	159 57	UD/A	85 28
CZ	405 131	UJ/A	156 158	ZDT	85 85
JP	404 120	ZDF	155 160	NEV	84 38
WIP	399 241	LW/P	154 56	CR	78 31
QJ	366 162	ZBH	151 149	DT	78 31
AWR	342 214	KD	148 61	HP	77 31
QA	340 137	KD	130 46	FR	70 30
YT	240 137	LA	120 75	FK	68 25

QW	65 30	XV	36 20	ZJP	18 19
LB	64 42	ZMH	36 36	ZCT	18 18
YO	61 61	AZ	35 10	EC	17 8
TH	61 61	ZDA	34 34	HD	17 17
JM	60 61	OV	33 33	NV	17 5
ZIT	60 61	UB	32 10	ABG/M	17 15
21B	58 58	CH	31 17	ZLS	17 17
ZZ	50 17	NF	31 9	PY	15 7
PV	34 39	ZDG	31 31	ZGJ	14 14
NBS	51 36	IF	30 30	ZLD	14 14
ZZE	51 51	ZFA	30 30	ZNZ	14 14
AO	48 23	AAB	28 15	RG	12 15
TD	48 28	AT	28 28	TT	9 9
ZLL	48 48	BC	27 27	TN/M	8 8
EO	44 30	TL	24 15	XC	7 7
FE	44 25	ZKA	22 22	CCZ/A	6 6
GM	43 43	ZKL	22 22	DL	6 6
ZIG	43 43	MD	21 21	ZOK	6 6
HZ	42 21	TB	20 20	ZTV	6 6
MU	42 17	WIG	20 20	3TG/A	5 6
JJ	41 42	ZKP	20 20	3ACN/A	5 6
OR	40 21	EE	19 10	RJ	5 6
PD	39 39	FJ	18 18	ZS	5 6
PF	37 17	AGB	18 18		

CW	Score	Per cent
XA	912 167	XY 404 72 PB 184 60
KX	790 133	QJ 368 72 NJ 18 10
GH	714 132	ARL 282 58 W B 72 15
FJ	628 100	QM 236 30 SF 70 18
AXJ	562 108	AAF 224 40 LJ 38 8
LV	414 70	UA 197 37

Open	Score	Per cent
HE	2098 618	WT 552 205 A/R 166 50
RM	1862 580	LT 834 158 Q 125 48
MB	1420 519	SO 557 158 AML 120 108
QO	1391 423	QO 481 201
UX	1268 431	RF 362 168 RZ 88 33
DT	1201 453	MY 272 50 FI 80 23
SE	725 725	NK 244 100 ABR 70 40
UC	717 329	CA 192 85 LZ 80 10
WL	714 129	NO 187 31 NRT 17 10
ZE	693 409	EZ 160 51

VK5	Phone	Score	Per cent	Score	Per cent
QX	1784 788	ZJH	328 328	TW	188 81
ZT	1255 623	XV	325 109	CA	186 80
KK	1234 541	CD	314 107	PD	181 70
LB	1120 422	ZQ	309 137	OT	185 50
PL	980 347	XU	306 105	PV	184 50
GM/S	933 338	QY	297 90	BP/S	183 83
MM	926 386	ZE	267 140	DQ	183 83
NN	917 360	GO	264 163	ZC	153 73
QZ	888 348	ZJH	258 148	LA	151 40
OV	916 418	VR	265 107	ZSD	149 149
NK	894 319	ZAC	282 285	SR	14

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CC	75	20	LQ	42	42	ZPW	27	27
OS	70	25	GJ	40	19	GZ	26	26
RP	68	29	AD	38	38	MK	24	24
ZQ	68	51	ZR	38	12	FO	18	6
ZHA	68	68	UL	34	10	KS	21	19
RS	67	18	AM	33	16	AG	17	11
JK	67	19	3AUG/5	32	32	PI	17	17
CX	66	41	DF	32	31	ZFA	15	15
GJ	66	66	KT	32	22	ZZX	15	15
JB/5	62	20	PE	32	15	DO	14	10
HM	62	15	ZFJ	37	39	DH	12	12
BU	61	56	TF	31	31	ZIS	11	11
EG	60	26	ZBM	31	31	ZMF	11	11
LZ	58	46	ZIB	31	32	CX	10	10
ZHV	55	56	BD	30	17			
ME	54	30	ZJJ	30	30			

CW	1052	190	DL	354	65	YY	146	32
BW	1052	170	ZCF	359	359	LA	216	91
OR	879	148	LU	290	55	UE	82	15
LI	869	151	HR	198	37	GK	60	9
FM	774	140	ZF	182	37	KU	50	10
XL	736	125	AU	180	26	KY	34	7
QG	574	111	OR	148	30	JG	14	6

Open	2201	870	PH/6	463	132	RK	229	60
IC	1474	689	ZCF	359	359	LA	216	91
IC	1459	431	QL	380	356	IP	210	50
OR	607	600	GI	357	100	RR	185	81
RC	532	138	PK	300	114	ZS	58	38
RQ	508	128	ZCR	271	255	KJ	57	40
RX	475	105	LQ	228	64	TL	35	16

VK8								
Phone								
CB	989	889	AN/6	271	210	ZAC/6	79	79
CR	977	406	YV	253	180		77	31
DR	974	323	PK	243	105	MO	74	34
JO	974	323	ZIH	203	205	MO	74	34
YVW	883		DO	196	76	NC	71	32
JO	682		SH/6	195	188	TU	70	28
BD	807	251	ZGI	193	182	VE	65	31
OR	856	231	KU	170	171		63	59
TR	829	258	TP/6	169	170	WC	63	63
FP	435	195	ZDA	149	150	JK	53	19
IF	435	215	SG	147	55	DO	52	17
ST	425	165	MB	139	87	WI	47	47
FW	418	172	BV	138	58	AW	47	47
PD	416	284	ZLO	137	137	BI	35	27
WL	413	176	KO	120	34	WD	21	15
EB	367	228	EJ	109	109	CD	20	11
HA	363	347	LG	108	90	XW	17	6
KY	351	277	AV	102	50	JO	10	10
W	342	233	DZ	84	35	ZDU/6	6	6
DA	308	150	KY	82	31			

WT	598	161	MA	266	76	HQ	78	18
AQ	584	123	VM	298	61	HO	72	14
HQ	574	120	SK	271	21	GA	30	11
RS	478	101	ZO	118	24			

Open	1120	399	HX	380	62	EG	162	80
ED	973	318	RV	282	125			
FI	703	185	HK	251	129			

VK7								
Phone								
JV	1504	916	HK	213	116	ZKC	61	61
FT	150	380	TT	159	87	CF	55	54
KH	655	299	CL	149	52	BJ	50	32
MX	516	256	DK	137	31	AW	48	31
GW	448	153	JA	116	31	ZJG	38	38
SF	344	144	YL	102	35	AB	32	13
JS	256	141	YF	79	71	ZDF	30	12
ZS	233	85	ZIF	71	71	JO	29	12
BM/7	215	100	ZBL	62	62	PD	10	10

CW	916	198	HE	600	143	JB	246	58
CH	810	156	GV	298	59	ZO	48	19

Open								
BC	1288	428	ZZ	402	108	AL	237	70
RH	404	245	RY	276	90	GB	108	54
VK8								
Phone								
CEG	759	306	CW	468	200	4ZEZ/6	10	10
DI	744	277	KZ	56	24	ZTW	9	10
AS	526	220	ZCR	16	16	DA	8	10
CW								
HA	1002	183						
VE9								
Phone								
LD	1276	218	TB	108	18			

P28								
Phone								
DJ	2935	753	GQ	588	150	GA	188	50
DM	952	245	WB	213	55			
CW								
EJ	580	92						

ZL								
Phone								
18KK	1858	488	2AUS	1502	417	2HE	284	73
1AGG	1457	294	2KX	954	247	3SZ	1308	371
18OL	127	30	20J	402	109	4MG	622	166

CW								
1BJH	1000	133	4BE	836	127			

Open								
1GQ	2040	350	1ACL	1236	262	4LJ	225	63
1AFE	1395	206	3ABC	481	123			

CHECK LOGS								
VK2ACO								
VK2BBR								
VK3BBB								
VK5AI								

RECEIVING OPEN

VK2	R Browne SWL2-BEQ	257	105
	S. Horst SWL2-BVS	180	76
	G. Ball SWL2-NGB	98	34
	P. Anslow SWL2-PMA	55	21
	R. Gostling SWL2-PMA	53	22
	A. Stollnow SWL2-SAR	40	15
	C. Maxwell SWL2-MAX	20	10
	A. Brown SWL2-APB	5	9
VK3	E. W. Trebilcock L30642	710	170
	L. Cowcher	803	254
	P. Taylor	402	180
	M. Batt VK3/13062	181	74
	M. Stephenson		
VK4	G. C. Duckworth L40539	1195	463
	J. L. Crawford	1024	360
	G. F. Featherstone L40382	698	281
	C. H. Thorpe L40618	258	132
VK5	R. C. Withford	1804	733
	L. A. Collins L50805	1347	378
	P. Dremans	803	208
	R. G. Edmeades L51022	291	125
	R. W. Farmer	278	97
	J. Warrington	239	239
	A. D. Orsall	211	95
	R. Warrington	150	150
VK6	F. H. Price	448	193
	J. R. Baxendale L60232	157	69
VK8	T. A. Hine	2061	591
ZL	Z. M. Pearce ZL2-129	842	154

LOGS RECEIVED TOO LATE FOR INCLUSION IN THE RESULTS

VK3APZ	31	21	VK5UJ	643	129	VK7AX	25	25
VK4CU	184	32	VK6RL	330	142			

CONTEST CALENDAR

11/12	ARRL 10 Metre Contest
11/12	Hungarian CW Contest
11/12	Spanish CW Contest
11/Jan	16 "ROSS HULL VHF MEMORIAL CONTEST"
18/19	SOUP QSO Party

January	
8/9	YU 80 Metre Contest
15	"Hunting Lions" Party
15/16	IL QRP Contest
28/30	CQ WW 160 Contest
29/30	French CW Contest

February	
12/13	"JOHN MOYLE MEMORIAL NATIONAL FIELD DAY"
28/27	French Phone Contest
	*Jedicals contest for Champions Trophy

CONTEST CHAMPION TROPHY — Contests for 1977

1. 76/77 Ross Hull VHF Contest
2. John Moyle National Field Day
3. Remembrance Day Contest
4. VK/ZL Oceania Phone
5. VK/ZL Oceania CW

CQ WW DX Contest. This contest will be over by the time you read this issue, but I have some late news of a new trophy of interest to VK. The Trophy is for Oceania — Phone — Single Operator — 14 MHz. The John Moyle VK3JW Memorial (International Pacific DX Net contest).

ARRL 10 Metre Contest
Starts 1203 GMT Dec 11 and finishes 2355 GMT Dec 12. The same station may be worked on both phone and CW. Send RST and serial number starting at 001. US and Canadians will give RST and their State or Province. Stations not listed based on give their ITU ref no.

Each contest QSO counts 2 points or 4 points if it's a novice. Multiply by the number of US States VE Call areas, DXCC countries and TU regions worked (US and Canada not counted).

Frequencies — CW 28.000-29.050 Novice 28.100-28.150, SSB 28.200-28.600 AM 28.800-29.000 Oscar contacts possible.

Waiting deadline for entries a Jan 21st to ARRL Communications Dept., 10 Metre Contest 225 Main Street, Newington, Conn 06111.

Hungarian CW Contest
1600 Dec 11 to 1600 Dec 12. All bands 3.5 to 26 MHz may be used. CW only. There are three classes: Single operator using a band, a single operator all band, and multi-operator all band. Exchanges RST and a serial number starting at 001. In addition, HA stations will send 2 letters to identify their country.

Scoring — 1 point for each HA contest and each country counts as a multiplier on each band. Final score is the total QSO points times the sum of the multiplier from each band.
HA countries: BA PB BE BN BO CS, RE, GY, HA, HE, KD NO PE, SA, SO, SZ TO VA VE ZA.

Send logs within 8 weeks to Radio Amateur League of Budapest, P.O. Box 2, H-1553 Budapest, Hungary.

Spanish CW Contest
2000 GMT Dec 11 to 2000 GMT Dec 12. All bands 3.5 to 28 MHz CW only. VK to work EA stations; each contact worth 2 points. Each EA call area worked on each band counts as a multiplier. Final score is sum of QSO points by the sum of the multiplier from each band. The same station may be worked on each band. Awards are gold, silver and bronze medals for the first 3 place winners.

Logs must be postmarked no later than one month after the end of the contest. Include a summary sheet showing scoring and other pertinent information, a signed declaration and your name and address in block letters. Send logs to U.R.E. Concurso Internacionales CW-1976 P.O. Box 220, Madrid Spain.

Ross Hull VHF Memorial Contest
It has been decided to include this contest for the 1977 Contest Champion Trophy as it is one of our national contests. The new rules for the contest were in last month's magazine and hopefully will lead to a large number of logs being submitted. At the time of writing there have already been openings to JA and K1 stations from VK3.



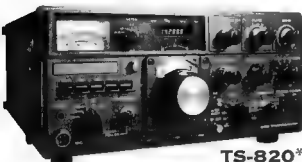
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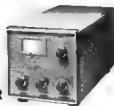
TR-2200



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TS-700A



**TV-502
TRANSVERTOR**

* DUE TO UNPRECEDENTED DEMAND SOME DELAYS HAVE BEEN EXPERIENCED IN THE SUPPLY OF TS820 HF TRANSCEIVERS

Things look set for a good season, and with the large amount of off the shelf type equipment around now, activity should be fairly high. So join the contest, have a good time, meet all your old friends, make some new ones, and please submit a log (it's much easier this year!)

John Moy's National Field Day

This contest also counts towards the 1977 trophy. Rules will be in next month's AR. It will take place on the second weekend in February. You will have from now to then to check all the antennae, rig, tents, put-ups, esky's operators and etc. Make sure you have a site to go to, and be prepared to have a most enjoyable time.

See you all in the Ross Hill.

COMMONWEALTH CONTEST 1976

The following is extracted from the RSGB results of the 1976 contest—

1. VE7CC 4188 points
2. VR1AA 3765 points
3. VK3MR 3277 points
4. VE3BMV 3245 points
5. VE7VZ 3322 points
6. ZL2BGC 3227 points

Receiving Section

1. Eric Trebilcock BC5R185 2145 points

Australian Scores

3	VK3MR	3577	60	VK3RU	790
6	VK2BPN	3028	62	VK2XQ	743
11	VK5NO	2937	83	VK4UA	738
	VK4XA	2535	85	VK3XU	705
20	VK7BC	2132	89	VK4MY	635
25	VK3XZ	1845	89	VK5Z2	635
31	VK5XB	1701	72	VK2NS	619
35	VK7CH	1428	77	VK2HC	588
38	VK3DL	1310	81	VK2YB	536
40	VK5KO	1268	82	VK2HW	533
41	VK7HE	1248	86	VK7RY	477
42	VK3CM	1181	88	VK5MA	359
44	VK7JB	1174	91	VK3DG	311
46	VK7OB	1154	86	VK5FG	209
50	VK3KS	1028	86	VK2GT	178
58	VK3YK	828	88	VK3HO	160
59	VK5KL	810	89	VK4XJ	148

Other Pacific area entrants

8	ZL2BDD	3227	19	ZL2BR	2142
11	ZL3QG	2725	28	ZL1HV	1808

and P2SEJ 490 in 58th position

"Snow" Campbell VK3MR therefore wins the silver medal for the second year running, while the bronze medal for the middle placing goes to Clarrie Castle VK5KL.

Scoring details, QSOs/Bonus per band, 80 to 10 metres are shown for VE7CC and -VK3MR, VE7CC 48/33 61/35 116/32 26/27 0/0 VK3MR 36/31 89/34 106/42 9/5 0/0

RSGB Comments:

The name may have changed, but the contest remains the same. This would appear to sum up the overwhelming sentiment among entrants this year. Although there was no repetition of the excellent conditions of 1975, we were glad to receive a healthy number of logs for this year's contest. A complete list of results put the majority of top placings in the Pacific area, contrasting with last year when the honours went to Europe and North America.

Once again we were delighted to welcome the large number of entries from Australia but were rather disappointed to note the continued reduction in support for the listeners section. Can it be that this is a symptom of a decline in CW interest?

Top placing this year goes to Lee Sawkins, VE7CC, with D. Lockyer, VR1AA, in second place. The latter result is somewhat amazing as Deputy notes in his log that he did not hear or work a single G throughout the entire contest. He must also be one of the few high placings in recent years not to have used a beam.

The small entry in the receiving section is no detract from the win by Eric Trebilcock, BC5R185, of the Receiving Rose Bowl in his 35th year of participation.

The main point of comment in logs regarding the rules related to the duration of the contest. There is some feeling that we should revert to 40 hours for the next period. This possibility was discussed by the committee last year and again this year and after much discussion it has been decided to leave things as they are for the 1977

contest. We feel that a 48-hour duration puts a great strain on VK/ZL entrants where the contest would extend well into Monday morning. Additionally, it is felt that this contest is one of the most demanding in the contests calendar, not only in terms of equipment but also in terms of propagation knowledge required and, most important of all, in the experience of the operator. These considerations are possibly what give this contest its unique appeal.

The other area of comment concerned CQ calls. The first few hours revealed the die-hards persisting with BERU and the more forward-looking with CC. We have it on good authority that the gentleman who sent CQ RU is not connected with any rugby organisation! However, within a short period everyone seemed to have standardised on CQ BERU and no doubt this will be the pattern for the future.

1977 contest is 12/13 March, same rules as before.

QSP

1977 SUBSCRIPTIONS

Members will be receiving subscription renewal notices for 1977 at about the same time as this issue of AR arrives. Early payment greatly facilitates EDP data processing and will ensure that call book information will be correct. This is doubly important because of the separate identification of members and non-members (including unfinancials) in the 1977 call book. This work will begin during February/March when unfinancial members become liable to have their AR address labels suppressed as an automatic EDP function.

AWARDS COLUMN

Brian Austin, VK5CA

EU DIPLOMA (GERMANY)

General

1. The award is available to licensed amateurs and shortwave listeners (on a "heard" basis).
2. The award is based on the calendar year. Only contacts in the current year and 4 preceding years are valid — see note below.
3. QSL cards must be submitted with the claim, which must be made in the special booklet, available from the sponsor's Awards Manager — see below — for 3 IRC.
4. There are no mode restrictions.
5. The fee for the award is 8 IRC which covers the return of QSL cards by registered mail.
6. The address for application is:

Walter Geyrhalter DL3RQ,
Post Box 262,
D-905 Kaufbeuren,
Fed. Rep. of Germany.

Note. This is published in 1976 so the current year is 1976 and the 4 preceding years are 1972, 1973, 1974 and 1975.

One contact per country per band is valid in any one year.

One point is scored for each valid contact in the current year (1976) and the preceding year (1975).

0.75 of a point is scored for each valid contact in the most preceding year (1974).

0.50 of a point is scored for each valid contact in the most preceding year (1973).

0.25 of a point is scored for each valid contact in the most preceding year (1972).

Totals are rounded to the nearest whole point. New applications must be submitted to arrive BEFORE the end of June and BEFORE the end of December to be counted for the current year. Additionally, to scores already submitted only require the additional QSL cards to be sent to the Awards Manager.

Requirements: A total of 100 valid points are required.

Country List C31 C71 C72 DL/DM EA EA6 E1 F C G G (Guernsey) G (Jersey) GD GI GM GW (Shetland) GW HA HBH HBH HV I IS IT IT JM (Bears) JW JX LA LX LZ MI OE OH OHQ OJQ OK

ON OY Q PA SM SP SV SV (Croat) SV (Rhodes) XA1 YF UA1, 3, 4, 6 UA2 UBS UC2 UC0 UJ1 UP2 UQ2 UR2 UA (Franz Josef Land) YO Y ZA ZB2 ZA 4U1 9H1

WORKED ALL ITALIAN PROVINCES

General:

1. The award is available to licensed amateurs.
2. Contacts on and after 1/1/1949 are valid.
3. Members of an IARU Affiliated Society do not send QSL cards. A list showing full details of the contacts should be certified by the Awards Manager of an IARU Affiliated Society. Non-members must send QSL cards to the sponsor.
4. There are no band or mode endorsements.
5. The fee for the award is \$1 or 10 IRC.
6. The address for application is:

ARI Servizi O Diplomi,
Via Scarselli 37,
20124 Milan,
Italy.

Requirements:

Confirmed contacts with 60 different Provinces.

List of Provinces:

Agrigento	Messina
Alessandria	Milano
Ancona	Modena
Aosta	Napoli
Anzolo	Novara
Ascoli Piceno	Nuoro
Asti	Padova
Avellino	Palermo
Bari	Parma
Belluno	Pavia
Benevento	Perugia
Bergamo	Pesaro
Bologna	Pescara
Bolzano	Piemonte
Brescia	Pisa
Brindisi	Pistoia
Cagliari	Portofino
Calabria	Polonia
Campobasso	Ragusa
Caserta	Ravenna
Canonica	Reggio Calabria
Catanzaro	Reggio Emilia
Chieti	Rieti
Como	Roma
Cosenza	Rovigo
Cremona	Sa arno
Cuneo	Sassari
Enna	Savona
Forlì	Siracusa
Foggia	Sondrio
Forlì	Taranto
Frosinone	Teramo
Genova	Terni
Gorizia	Torino
Grosseto	Trapani
Imperia	Traveto
L'Aquila	Treviso
La Spezia	Trieste
Lecce	Udine
Lecce	Verona
Livorno	Venezia
Lucca	Verona
Macerata	Vercelli
Mantova	Venezia
Matera	Viterbo
Matera	

LARA

Ladies Amateur Radio Association

This month the LARA column comes from Anne VK7LY. Anne is one of the earliest members of LARA from outside VK3 and is a familiar and welcome face at conventions here in VK3.

"While a VL operator is disadvantaged to a certain extent by lack of strength and lack of height when it comes to the 'craggy' work the boys for the female carries with it certain advantages.

First of course comes the 'stunning' looks and sighs of admiration from other VL's accompanied by the remark 'Oh but of course I could never do that' when it comes to the 'craggy' work the boys for the female carries with it certain advantages.

The most obvious asset is ones never-ending tool kit and spare parts supply to be found not in

ELECTRONIC ENTHUSIASTS EMPORIUM

ITEMS OF INTEREST TO HOMEBREWERS. See current issue "Electronics Today International" for more detailed listing of components.

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MPF103	.65	LM370	2.95
MPF104	1.10	LM373	4.70
MPF105	.65	LM355	.85
MPF106	6.0	LM356	2.75
MPF131/121	1.30	LM5626	9.50
2N706A	.95	LM565	2.80
2N718	1.60	LM567	3.50
2N2222A	.95	LM729	.80
2N2905	.80	LM741	.48
2N3638A	.50	LM1496	1.80
2N3642	.45	LM3900	1.75
2N3819	1.25	MC1350	3.60
2N5245	.65	MC1351	1.95
2N5580	7.75	MC1468	6.50
2N5651	8.40	MC1648P	P.O.A.
2N6804	17.50	MC7805	2.50
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*4-250A	71.90
*6156	P.O.A.

* Indent only

the ham-shack, but in the so called female domains of the house. And if by chance one essential piece of gear is mislaid just when it's needed, an equally good alternative can usually be found.

While a hair-curling wand may not quite double as a soldering iron (I haven't actually tried it yet, but it gets darned hot) it may serve to bend into shape that piece of ice-cream container you want for insulating purposes. Your coak has water in it? Just put it under the hair-dryer for an hour or so. The laundry has its use too — pegs and ice-cream sticks make excellent clamps, and those empty plastic containers used for soap, bleach, etc., are excellent containers for weather-proofing traps for your disco.

The rotary clothesline doubles as a 20 metre rhombic and curtain-rods can be commissioned if you are really hard up for e-wire for your beam.

I've got your hobbies cupboard (pre AR of course), I've just found about 1000 yards of plastic tubing from a project long since forgotten. Don't forget the sewing cupboard either — stitch-rippers are handy when working with coak, and needles of various sizes are handy for threading wire through awkward spots.

Some items may remain a YL secret lest the cat's catch on and our precious storehouse is looted while we are away shopping. After all, it's bad enough when one of our precious knitting needles is filed down for a tuning too, but I have it first-hand that a certain gentleman in Western Australia has taken to using cake-tins for phasial! Heaven help us YL operators if ever the on's call on to what we do use to get that job done.

Just a final word for this year from LARA — the first whole year of LARA activity — to wish all members, associates, friends and neighbours on the bands, a Happy Christmas and New Year. 33's from LARA.

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

The Editor,

Dear Sir,

Some experimenters trying my noise canceling circuit in AR, Oct 78, may be having difficulty in obtaining an effective noise null. This is because there is no provision for adjustment of phase, except for that which can be obtained with the noise antenna tuner.

By inserting a switchable phase reversing transformer (rat. Orr's Radio Handbook pg. 2212) a much improved null can be obtained.

Constructed the same as T2 and inserted between the main antenna and R2 with the pot. reversible so as to obtain either 0 or 180 degree phase shift.

I would like to hear from experimenters using the circuit and from their travels.

Drew Diamond VK3XU.

The Editor,

Dear Sir,

Having been a member of the WIA since 1930 I feel that it is time that I voiced my complaints about the present way "AR" is produced and distributed.

This is brought about by the fact that the October issue only arrived yesterday (Friday 15th) and in the issue that I received there was no VK3 insert or information about the Eastern Zone Convention.

For many years "AR" was always in the members' hands within the first day or so of each month and on occasions was out before the beginning of the month.

With the present drive for new members it is time to get the magazine out at the beginning of the month again as it is very disheartening to wait day after day for the "Mag" to arrive.

Much has been said about the high cost of publishing "AR" and I cannot understand why it is necessary to have it printed on such expensive

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IONOSPHERIC PREDICTIONS

Lan Paynter, VK3ZGP

PREDICTIONS.

Have recently been comparing the two basic prediction charts supplied by IPS, the MUF/ALF charts and the Grafex series as used to prepare the AR charts. Along with the current monthly preparations was a series of planning predictions based on various sunspot numbers.

The latter were quite comprehensive listing the spectrum from 3-40 MHz and it was surprising the detail shown that is not evident in the usual MUF/ALF series.

This was prompted by an article in the IJU Journal by Charles M. Rush, USAF Cambridge Research Laboratories on "Ionospheric observation networks for use in short term predictions". My own short exposure has led me to follow short term variation in the structure of the ionosphere. These variations lead to changes that differ significantly from the monthly averages for MUF/ALF.

Comparisons between the MUF/ALF curves and the Grafex system do allow for a closer watch being made on the possible departure from average particularly during the period prior to, and subsequent to disturbances — that affect propagation.

The paper was interesting in that it proposed a globe network of observatories, that could rapidly exchange information of local conditions that are reflected by solar flares, geomagnetic disturbances etc., so predictions could be rapidly made available to users.

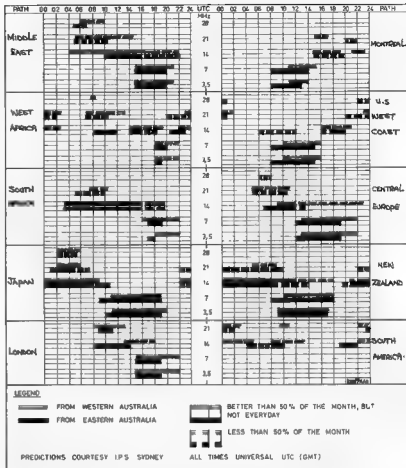
The proposition that short term observations provide a better indication of the ionospheric structure and electron content than do empirical formulas. The emphasis being placed on observing and predicting changes in the electron density region of the ionosphere, determining the characteristics of long haul HF circuits.

That so many use the MUF/ALF curves as gospel is unfortunate. Because they vary hourly, daily it is necessary to be able to observe and note just what is going on.

The predictions could well be described as a guide to when a particular path should be open when all the conditions used in preparing the prediction have been met. At the time in the Solar Cycle, an increase in solar activity will enhance conditions, where a large geomagnetic disturbance will degrade.

The provision of a world-wide ionospheric research network to put information into the hands of users without delay could revolutionize predicting and make it very similar to weather forecasting in general. The extremes that scientists went to in the manned lunar probes go to show how their resources can be marshalled to provide service to users.

No doubt the costs will kill the proposal but there is no reason why amateur operators throughout the world could not form their own ionospheric alert network. Amateur communications have a wide diversity of systems and should be capable of forwarding information on world-wide in a very short



period. A network of stations with RTTY could push data and retain this data for use for local access almost round the clock. Interesting thought? "Dial-a-forecast" service for everyone!

What were your experiences during the recent eclipse? I trust you have made your own observations for your records. I would be interested to hear from you.

Well this is the end of another year and a very quiet year from an activity point of view. The smoothed running sunspot number continued to decline, though increasing numbers of Cycle 21 spots are now in evidence. It does look like

the smoothed low of 5 will be reached early in the new year. If the activity increases by March then there is a strong possibility that activity will rise fairly quickly. The next possibility in lieu of March is the following August. In all 1977 should be worth watching.

The next maxima is expected to be a smoothed number of around 80 — or equivalent to the 1974 period and occur around 1984. Guess 10m will not be very active. Wonder what WARC will produce?

Wishing you all the best of DX in 1977
73's VK3ZGP/NAC

paper. The NZART publication "Break In", "Electronics Aust" and many other periodicals use a good class of newspaper paper which must be cheaper than that at present being used for "AR" and consideration should be given to cutting costs by using a cheaper grade of paper.

If the placing of inserts in the mag no delays the posting of same then it is time to cut the inserts out and have extra pages printed in the Mag. For the various State's notes as was done many years ago.

I realise that a lot of voluntary labor goes into the production of "AR" and while we appreciate the work that is being done, this is no excuse for the late arrival of the publication.

It is hoped that you will get the magazine out on time in the future even if it is necessary to change the printer or members of the committee (who are not pulling their weight) to do so.

"AR" means a lot to the country ham, in particular, and I trust that we can look forward to an improved service from now on.
W. R. Jardine VK3PR.

The Editor,
Dear Sir,

I was interested to read the article by P26EM/VKAEAM in the September AR. I feel however a few clarifications would be worthwhile. Although (obviously) not a frequenter of the HF bands, I have some knowledge of the events described as I was resident on Tahiti at the time the incident occurred.

Firstly, some pieces of geography. The island where the accident occurred is known as Rapa, the real name of "Tosoboulwai" is Tubuai — both islands in the Australias group. Tubuai is about 24-30 hours steaming from Rapa

and 2 hours flight time (Fokker F27) from Papeete. Whilst the "normal" steaming time from Rapa to Papeete in a cargo schooner — like the "Tuhua Pas" is about 50-60 hours.

My heartfelt congratulations to all the hams and others involved on this occasion. However there is a definite lack of enthusiasm by the local authorities in Tahiti to give much credence to any report delivered by "Radio Amateurs". The reason for this stems from the reluctance of visiting yachts equipped with amateur gear to apply for French licensing but continue to operate whilst anchored in port at Papeete — which to all intents and purposes is an illegal act (within the 3 mile limit). The other problem lies in the fact that a reasonable proportion of these same yachts do not have crew holding amateur licences but take advantage of the high seas to use a motley collection of Panamanian, US, St. American etc

cal signs that were never issued in their respective countries.

I see the solution is identical to that proposed for our own VK CB. Prates a little education and kindly helping hands. It is not difficult to obtain a call (ask the UNSWARS). If we give these people who are on the fringe of Amateur Radio we would do our hobby a great service and also increase our usefulness in emergency situations.

Douglas C. Rosser VK2ZEX.

The Editor
Dear Sir

I am on a world-wide Dx trip, accompanied by my wife. We started 3 months ago in Germany and are visiting Dx stations on the way to try to activate rare call-signs.

I am writing monthly articles for the German "CQ-DL" magazine which has a circulation of 30 000, describing amateur radio stations in various countries and interesting things about the life there.

So far we have travelled through the Middle East and Asia. We will be coming towards Australia in December 1976/January 77. Our route takes us through Papua/New Guinea, into China. We would like to travel down to Brisbane, Sydney and Melbourne visiting ham stations along the way. We want to meet several hams and write articles with pictures about them.

Later our trip will take us to New Zealand and the Pacific Islands ending towards Hawaii and then to California, where my wife is from.

I am on the air quite often from rare Dx stations and ask a lot of VKs and. We can bring the QSL's along or send them direct.

Best 73s from Sabah in North Borneo at 01M00, from Peter and Kathy.

Peter Jenua D8XW



D8XW, Peter and YL Kathy at their station in Frankfurt, Germany.

The Editor,
Dear Sir

I have been asked to bring to your attention, a motion passed at the Moorabbin and District Radio Club's October General Meeting on Friday, 15th October 1976. The motion reads:

"That the Moorabbin and District Radio Club ask the Wireless Institute to modify its attitude in respect of Citizens Band operators and henceforward make positive efforts to assist would-be operators in their attempts to secure wider and more legitimate operation on that service."

By way of explanation the following points are made —

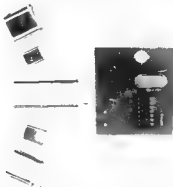
1. There appears to be no fundamental reason why any individual should be denied the use of a communications medium such as the so-called Citizens Band, provided that there be compliance with any licensing fee structure and technical requirements as may be reasonably imposed by the Regulatory Authorities. Difficulties in administration, the need to show reasonable cause or the attitude that communication is a privilege cannot be considered valid grounds

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for continued objection to the exercise of a fundamental right.

2. Rights or strongly the expressed viewpoint of the institute (some facets of which were quoted out of context in the October 1976 issue of AR) has been taken as a contrary one by those seeking legitimate use of the Citizens Band. Recent television interviews with (currently illegal) operators have made this quite clear.

3. It is the Morabin Club's opinion that ultimately the Institute's stance cannot be substantially neutral as is now the case. Ultimately the institute will have to come out either for or against the aspirations of would be Citizens Band users. In the event the institute did not find in favour of Citizens Band users, it must be clear that the more cogent the "contrary" arguments put forward by the institute the greater is the probability that these same arguments could be applied against the institute and its members.

4. Current information indicates that (legitimate or not) there is already more CB equipment in Australia than amateur equipment. It follows there are already more CB operators than amateur operators. In terms of future Institute membership it seems more pragmatic to foster alliance with CB users than to oppose them or ignore their existence. In the event that the present demands in respect to Citizens Band are met, it is not "reasonable" to assume that some form of Citizens Band Association will be formed. Such an association will, solely by virtue of the probable number of members, be at least equal in influence to the Institute so far as the general public and the Regulatory Authorities are concerned. It is not impossible that such influence could exceed that of the Institute.

5. It would be to the Institute's advantage to see a separate — and legitimate — means of air communication established. Those wishing simply to have a communication facility could use authorised frequencies (instead of being tempted to "pirate" on amateur bands) whilst those wishing to become technically competent in the design and manufacture of equipment for themselves could, perhaps, lend towards the amateur ranks. Would it be any sacrifice at all if the Australian Amateur Service freely gave up its 27 MHz allocation to CB users?

6. It is a fact of life, however unpleasant to regulating authorities and/or amateurs wishing to maintain the status quo, that mass communications is here and will stay. It would be fatal to the amateurs in general if they let their associations did not objectively recognise the traumatic changes of recent years. The belief that amateurs are still a privileged race has been outmoded by the very technology they espouse.

Torrey in his book "Future Shock" clearly describes the demise of people and organisations who refuse to acknowledge change or who refuse to accommodate change. Their sphere of influence and interaction becomes vanishingly small and may go to the grave as vegetables.

Let this not happen to the Institute.

Yours faithfully,

Harold L. Harburn VK3AFQ
Committee member, Morabin and District Radio Club. ■

PROJECT AUSTRALIS

David Hull, VK3ZDH

AMSAT-OSCAR 6 and 7 ORBITAL DATA CALENDAR
In co-operation with AMSAT, Skip Reymann, W6PAJ has published an improved AMSAT-OSCAR orbital data calendar containing all orbits for 1977 for both AMSAT-OSCAR 6 and AMSAT-OSCAR 7. Designed so that it may be hung on the wall, the calendar includes information on the operating schedules and frequencies for both spacecraft, and also the telemetry decoding equations. Also included is a step-by-step introduction on how to determine times of passage of the two satellites.

The orbital calendar is available post-paid for \$5.00 U.S. funds or 30 IRC's (\$3.00 to AMSAT

members, and free to AMSAT Life Members). Overseas orders will be air-mailed. Orders and payments should be made to:

Skip Reymann, W6PAJ
P.O. Box 374,

San Dimas, California 91773, U.S.A.

Please include a gummed, self-addressed label with your order to speed up processing.

Proceeds from the Orbital Calendar benefit AMSAT.

OSCAR 6 JANUARY 1977

Date	Orbit	Time	Long
Date	Orbit	Time	Long
1 19264	01.24	79.50	
3 19269	01.18	78.35	
5 19276	00.23	64.60	
7 19281	01.18	63.38	
9 19214	01.13	77.10	
11 19228	00.13	82.10	
13 19239	01.08	76.65	
15 19251	00.06	80.55	
17 19254	01.03	74.60	
19 19275	00.03	58.64	
21 19289	00.58	73.35	
23 19402	01.53	87.10	
25 19416	01.53	72.10	
27 19427	01.48	85.85	
29 19439	00.48	70.55	
31 19452	01.42	84.60	
1 19464	00.42	69.60	
3 19477	01.37	83.35	
5 19488	00.37	68.35	
7 19502	01.32	82.10	
9 19514	00.32	67.10	
11 19527	01.27	80.85	
13 19539	00.27	65.85	
15 19562	01.22	79.60	
17 19564	00.22	64.60	
19 19577	01.17	78.35	
21 19589	00.17	63.35	
23 19602	01.12	77.10	
25 19614	00.11	62.10	
27 19627	01.06	75.85	
29 19639	00.06	60.85	

OSCAR 7 JANUARY 1977

Date	Orbit	Time	Long
Date	Orbit	Time	Long
1 9739	01.48	77.09	
3 9764	01.43	75.59	
5 9751	00.48	61.97	
7 9776	00.41	60.47	
9 9789	01.33	74.09	
11 9801	00.33	58.97	
13 9814	01.29	72.59	
15 9825	00.28	57.47	
17 9839	01.23	71.09	
19 9851	00.22	56.97	
21 9864	01.18	69.59	
23 9876	00.18	54.47	
25 9889	01.10	66.09	
27 9901	00.09	52.97	
29 9914	01.04	66.59	
31 9925	00.03	51.47	
1 9939	00.57	60.09	
3 9952	01.51	75.79	
5 9964	00.51	63.99	
7 9977	01.45	77.21	
9 9989	00.44	62.09	
11 10002	01.39	70.79	
13 10014	00.38	65.51	
15 10027	01.32	74.21	
17 10039	00.32	59.09	
19 10052	01.26	73.71	
21 10064	00.25	67.59	
23 10077	01.19	71.21	
25 10089	00.19	56.09	
27 10102	01.13	69.71	
29 10114	00.12	54.59	

WIA CONVENTION ROCKHAMPTON

The Convention of the Central Queensland Division of the WIA held on the 28th and 29th of August was indeed a huge success.

The guest of honour, Mr. David Wardlaw VK3ADW, the Federal President addressed a gathering of well over 100 and spoke of the necessity of amateurs and would be amateurs to fully support the WIA in its WARC work, of course never has an appeal been more urgent.

The repeater VK4RAR — R42 made its debut and Adrian Billard VK4MM gave a summary of its operation. Adrian was responsible for its electronics.

The smorgasbord was nothing less than a gourmet's delight.

The fox hunts saw very short lived foxes. Older "hams" of 60 years plus were seen racing like greyhounds through the undergrowth, such was their enthusiasm.

A 144 MHz signal was heard in Brisbane from Mount Archer the "local hill".

The prize winning antenna that accomplished this feat, a yagi with a 20 feet boom was seen heading towards Bilboa after the convention, in the charge of its new owner. He's coming back later for "the HII".

The ladies had a lovely time discussing their complexion with a skin care spe-

cialist who displayed a colourful array of cosmetics. For a radio convention, this we understand is a unique idea with great merit.

My solid state after burner, an exhibit, now smells like Ashes of Roses. Ah well!

Exhibits spanned a half century of progress. The equipment displayed ranged from a horn speaker of the early 1920s to colour TV cameras and monitors.

The convention was rounded off with a barbecue of succulent local steaks, salads and hot meals.

The committee, the organisers and the ladies must be flattered at the compliments in praise of their efforts. Well done Rockhampton.

—VK5CGB/VK4 John W. Emmet PR Officer, Central Queensland Branch WIA. ■

QSF

IONOSPHERIC INDUCED INTERFERENCE

QCC has been told that by allowing AM "clear channel" radio stations more power, other signals passing through the ionosphere could be harmed. These harmful effects could manifest themselves as interference, scattering and severe weakening of signals. Currently, "clear channel" stations, those given an AM frequency between sunrise and sunset in order to eliminate interference, are restricted to 50 kW. In order to overcome the unsatisfactory nighttime service assured in some areas it had been proposed that the power output be lifted to 750 kW! The Telecommunications power Aug. '76 article carries on to say that a further field test is to be conducted.

HAMADS

- Eight places free to all WIA members, \$9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Commercial advertisement is excluded.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

FOR SALE

Selling Whole Station — includes Marconi CR150 receiver (2-50 MHz), home brew VHF AM transmitters 22 thru 576 MHz. Miscellaneous of converters, power supplies, valves, transistors, boards and random bits. What offers? VK3BAR QTHR. Ph. (03) 725-8702 A.H.

Union 2020, as new condition, \$500. VK2B2. Ph. (02) 548 2020.

F101B Transceiver, no mode, good condition, VK2B9J. Ph. (02) 84 7170 A.H., (02) 631 7688 Bu.

FTDX 400 Transceiver, good condition, \$325. VK2AKG, 20 Timaru St., Kiriwaea 2232. Ph. (02) 521 7050.

KW Viceroy 10-80m SSB/AM/CW Tx and Hammarlund HQ170 Rx 160-2m, \$230 QND, VK3ATT, QTHR. Ph. (02) 478 2699.

NT32A Hallicrafters, Tx 240V AC PS, complete with mic, and instruction book very good order, \$175. FL1000 Linear, EC instruction book, \$230. VK2BDN, QTHR. Ph. (02) 747 5149.

Adrian 12 volt mobile type 3003 power supply with circuit, wired for FT202 transceiver, all voltages for other transceivers, high, low, bias, etc. Can be changed for other sets. \$75.00. VK5JX. Ph. (08) 43 4138, QTHR.

HW-7 QRP transceiver (going HW-8), numerous assorted HF transmitting valves (813, 807, 6146, 6X4, 6X5, 6X6, 6X8, 6X9, 6X10, 6X11, 6X12, 6X13, 6X14, 6X15, 6X16, 6X17, 6X18, 6X19, 6X20, 6X21, 6X22, 6X23, 6X24, 6X25, 6X26, 6X27, 6X28, 6X29, 6X30, 6X31, 6X32, 6X33, 6X34, 6X35, 6X36, 6X37, 6X38, 6X39, 6X40, 6X41, 6X42, 6X43, 6X44, 6X45, 6X46, 6X47, 6X48, 6X49, 6X50, 6X51, 6X52, 6X53, 6X54, 6X55, 6X56, 6X57, 6X58, 6X59, 6X60, 6X61, 6X62, 6X63, 6X64, 6X65, 6X66, 6X67, 6X68, 6X69, 6X70, 6X71, 6X72, 6X73, 6X74, 6X75, 6X76, 6X77, 6X78, 6X79, 6X80, 6X81, 6X82, 6X83, 6X84, 6X85, 6X86, 6X87, 6X88, 6X89, 6X90, 6X91, 6X92, 6X93, 6X94, 6X95, 6X96, 6X97, 6X98, 6X99, 6X100, 6X101, 6X102, 6X103, 6X104, 6X105, 6X106, 6X107, 6X108, 6X109, 6X110, 6X111, 6X112, 6X113, 6X114, 6X115, 6X116, 6X117, 6X118, 6X119, 6X120, 6X121, 6X122, 6X123, 6X124, 6X125, 6X126, 6X127, 6X128, 6X129, 6X130, 6X131, 6X132, 6X133, 6X134, 6X135, 6X136, 6X137, 6X138, 6X139, 6X140, 6X141, 6X142, 6X143, 6X144, 6X145, 6X146, 6X147, 6X148, 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Yaesu FT101 Model 10-160 Ms, model prior to "B", mint condition, no mode, complete with P/T mike, load, manual, etc. \$400. H. Crisp VK2LX, QTHR, Ph. (047) 92 2290.

Yaesu SBB-CW Base or Mobile Equipment. FT75 with 10 xials, spare final tube, mobile cradle, manual. FV50C VFO (10 to 80m), FT75 AG PSJ, incl. speaker, DC75 DC PS \$285 the lot only. VK3JL, QTHR, Ph. (031) 874 5632.

Collins 75S-3 Rx 10733 and 3251 Tx with DX engineering processor model LC-1-325, complete with static 100 mc. and G stand; 510F-2 power supply and HD 250/110 V metal boxed with outlets transformer. Linear amp. SB200 Heathkit (250 volts). Beam TH3JNR 3 element and rotator. VK6NE, QTHR, Ph. (092) 46 3232.

MORSA Xilis for Ch. A, 40 repeater 2 repeater 4, very good condition. VK2YV, QTHR, Ph. (03) 82 7982.

Yaesu-Musen FT200-PP250, mint condition, complete unit including all 10m xials, spare valves new valves fitted, no mode, bought for service use, found it cannot be xtl locked, \$330. Apply 23 Walden Street, Newcastle, 2250, Ph. (003) 44 4172.

FT200, FP200, FV200, not 3 years old, mint cond., no mode, eng. man. offer, packing mkt., \$400. Gonella \$200 ART rec. A. B. C. D boxes, VHF/HF conv. dual P/S rect. \$50. AWA audio amp. AC 30 amp. dual rect. ex. cond. \$10. TGA 1047 FM 5m base. Ch. 40 xials, orig. man. \$30. 6m carphone U1B P/S 12V U/xials, \$5. VK4CY, QTHR, Ph. (071) 43 1485.

Re ARB, with handbook and speaker, less power supply, \$15 or nearest offer. CRO, 50P1, in working condition. 2 spare CRT's, circuits, \$20 o.n.o. VK3BKH, QTHR, Ph. (02) 57 7894 A-H.

Kenwood TR7250, VHF/FM transceiver, complete with all accessories and English instruction manual. Xils for Ch. A, Ch. 50 plus T/R 145.84 and 145.95. As new used for home station only, \$185. Ross Treloar, VK2BZP, Ph. (02) 239 5267 Bus.

Collins KW100 transceiver, 3 yrs. old, mint condition, \$1160. FTDX400 ext. VFO and matching speaker, \$100. Excellent performer. F7DX400 Rx FM 2 and 6m, \$255. FLDX Tx, \$225. VK7AZ, QTHR, Ph. (002) 44 1165.

Beedie LM7 frequency meter complete with AC power supply, \$30. VK3TG, QTHR, Ph. (003) 82 1836.

FTV-550 6m transceiver, used only once, ex. cond., complete all access. in box, \$130. MTR-137 6m FM transceiver \$25.50 MTR, \$50. 6m 5 el. beam, folded, dipole D.E.I. ex. cond., \$40. Dictione's good cond., P.B. units and mics, \$10 each. Bruce Kendall VK3ZDM, 10 Carter Cr., Werribee, 3030, Ph. (03) 741 2382.

Oster SWR and power meter as new, \$40. Kenwood Cardiod dynamic disk mike, new, \$37. MFJ super logarithmic speech processor, unused model LSP 825 \$11. \$150. RF Ammeter D-3 amp, 50. Eric Blarrie, VK2BEX, 8/65-68 Florence Street, Hornsby, N.S.W., 2077, Ph. (02) 476 5092.

Realistic "Patrolman B" RX, very good cond., with AM, SW, FM, VHF, UHF (450-470 MHz) and air. FM has been tuned to portion of lo-band, \$30 (tells new \$130). National IC-212 tape recorder, exc. cond. \$40. IC-212 rec. 2-4, and 2, 4, 6, 50, simplex 37, 40, 43, 49, 50, 51, 53, 61, 65, 70 V, \$300. Europa-B 2 Mx transverter for use with FT101, \$150. Lionel, VK3NM, QTHR, Ph. (03) 88 3710.

Heathkit Model HW-22A, 20 W PEP sideband transceiver, with homebrew 12V DC power supply. Little used, best offer. VK2ABW, QTHR, Ph. (02) 86 1101.

Ken KP202 2m FM fitted with simplex channel's 40, 50, repeater channels 2, 4, 6, 8 with Nicad battery compact battery charger, KEN leather case, stubby helical antenna, manual, \$140. VK3YDR, Ph. (03) 785 2792.

Icom IC-22A 2m transceiver, 7 channels, mobile mount, manual \$170. Marc Jackson VK3ZHV, 219 Peachtree Road, Smithfield Plains, SA 5114, Ph. (08) 87 3020 Bus. or (08) 254 7515 A.H.

WANTED

Yaesu FTV505B, FTV250B, FT101E. Bob, Ph. (02) 46 0425 Bus., (02) 46 3727 A.H.

Your Reports on propagation during the total eclipse. Forward to VK3AFW, QTHR.

SILENT KEYS

It is with deep regret that we record the passing of —

Mrs. A. A. GROUSE
Mr. A. J. MARTENS
Mr. C. J. OTHEN

VK3KAD
VK3MA
VK3ON

JOHN WINTON

John was first licensed on 10 June, 1932, and was Secretary of the WIA in the early thirties. He was very active until the war years and was seriously wounded in June, 1945 at Bougainville.

It was not until the 50's that he became active again with projects, and during the 60's he began transmitting again.

John was plagued with illness since his retirement 4 years ago, but never lost his interest in electronics and amateur radio. John Winton passed away on 4th June, 1976, aged 64, and we extend our deepest sympathies to his widow, Margaret, and family and friends.

Derived from information supplied by Con VK3KX.

PETER LEMPIERRE

VK3ALL

On Monday, 27th September whilst en transit to a club meeting at South Melbourne, Peter Lempiere VK3ALL suffered a heart attack and passed away. Peter had been a licensed amateur for many years and was chiefly responsible for starting the Disabled Radio Amateurs Club — VK3ZC.

The Club was constituted in May, 1973, and has met actively over the past 3 years, and holds field events and other activities.

The principle aim of the Club, as originally envisaged by Peter, is to foster interest in Amateur Radio amongst disabled and interested able bodied persons. Equipment used at the club includes an FT200, IC21A, DV21... TH3 Mark 3 beam and other gear.

This equipment has been purchased with the help of the Victorian Society for Crippled Children and Adults, mainly through the efforts and with the direction of Peter Lempiere.

He was the driving force behind the Club and will be sadly missed by everybody. All club members express their sincere sympathy to Peter's family.

Ian Waterland, President; Ted Egan, Past President, Disabled Radio Amateurs Club.

ERIC GORDON PUGH

VK3ADK

Eric gained his licence on 15th March, 1958, and established his first amateur station at Collis Harbour, N.S.W.

Later he moved and re-established his station at Lismore, Kempsey, Concord West and finally at 302 Morrison Road, Ryde, where his towering beam has been a landmark for years.

Eric might well be regarded as one of the most widely known "Hams" in the world as he has been constantly involved in DX since 1958. In 1964 Eric and his XYL Alice visited U.S.A. and they met a number of DX friends in person.

Eric Pugh was a most dedicated "Ham" and he always built his own equipment to professional standards.

Eric spent 27½ years on the staff of 2GB at Sydney and had not long commenced to live in retirement when his unexpected sudden death occurred at his QTH on his 64th birthday, 11th October, 1976.

John VK3ADN

BILL LEWIS

VK3YB

Because of his intense interest in the Wire-less Institute, I feel more should be known regarding the late Bill Lewis, VK2YB, than just a mention in the list of "Silent Keys". Prior to obtaining his licence in 1926, he was an active member of the Croydon Radio Club which held the call of VK2YB and when that club handed in the call, Bill applied for it.

He joined the WIA in 1928 and was always a staunch supporter. He performed many functions for the WIA, including many years as President, a number of periods as a member of Council, a member of the Dural Committee, member of the Constitution Committee.

VK2YB was a regular club heard on field days during his amateur career and Bill felt it a "duty" in some respects to always take part in the John Wiles Memorial Field Day and had already made plans for the next one.

His interest was CW and only recently built a Heathkit HW101 transceiver, but rarely used the microphone. He was a member of the RAAF and prior to World War Two operated as VK2YB whilst based at Pearce. Later he was to be commissioned as a radio officer. On Anzac Day he normally marched with 150 Squadron.

After World War Two he opened a radio and electrical business in Oxford Street, Paddington under his old call. In recent years he moved to Ryde and only a few days before his death he received his DXCC certificate.

His first heart attack occurred 10 years ago, and was to affect his life style from then on, but Bill would not give in.

From 1928 until his death, he was a member of the Western Suburbs Motorcycle Club and in his early days rode a Harley Davidson machine, christened "the wreck of the Heapsrus".

Ten years ago he became a member of the well known and popular Sydney Male Choir and at the Chapel service, four members of the choir sang as a tribute to their late member.

For myself, I have lost a close friend of over 40 years in amateur radio. VK3GL

Tx or Ycvt for all bands CW or CW/AM only; commercially made. VK5QO, QTHR.

RTTY Demodulator wanted. G. Gendinning, 4 Hayes Lane, Mackay, Q'd. 4740.

FT-401B Transceiver with manual, must be good, details, including mods, if any, to VK2PT, QTHR, Ph. (049) 43 1308.

Eddystone general coverage receivers; Collins 32V3, Johnson Valenti or Drake NT1 transmitters. Price and condition details to David VV20, 17 Brodie Crescent, Christie Beach, S.A. 5165. Ph. 382 4159.

Buy or photostat manual for Lafayette TE-30 CR Analyser. Details to David VK3AP, 17 Brodie Crescent, Christie Beach, S.A. 5165. Ph. 382 4159.

Galaxy GT550 or Galaxy 5 Mark 3 with PSU, remote VFO, VOR and calculator preferred. Good operational condition essential. A. E. Cooling VK5ZE, 20 Blinacow St., Elizabeth South, S.A. 5112. Ph. (08) 255 2249 bus. hrs. or (08) 255 7506 A.H.

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Use a tried and proved speech processor to improve performance of your 101, 101B or 101EE on both transmit and receive! The G3LLR FL CLIPPER is designed specially for these sets.

Operates on all HF Bands and is particularly effective when used on Noise power limit, or mode. A'so, limited availability of new model to suit FT-200. Special Xmas price — both models \$75. Available from—

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R.H. Cunningham
Pty. Ltd.

Technical Data:

Frequency response 16...20 000 Hz. Impedance 2 000 Ω . Weight 170 g. Cable length 3 m.

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493-499 Victoria St.,
West Melbourne 3003
Phone: 329 9633

Telex 31447

N.S.W.:
4-8 Waters Rd.,
Neutral Bay 2089
Phone: 909 2388

Telex 21707

W.A.:
256 Stirling St.,
Perth 6000.
Phone: 28 3655

Telex 93244

QUEENSLAND:
L. E. Boughen & Co.
Cnr. Milton & Baroona
Roads, Milton 4064
Phone: 36 1277
Telex 41500

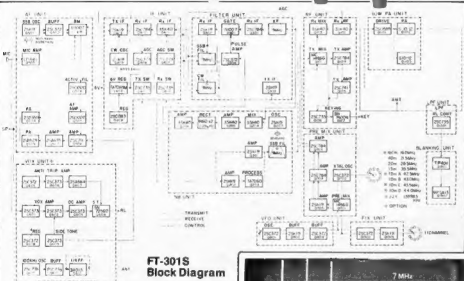
SOUTH AUSTRALIA:
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Unit 25, 28 Gray St.,
Kilkenny 5009.
Phone: 268 2801



Latest addition to
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FT-301S ALL SOLID STATE HF TRANSCEIVER

The FT-301S is an advanced fully solid state H.F. SSB and CW transceiver covering 160 m through 10 m, including one auxiliary band and WWV. It has all the outstanding features of Yaesu's top performance FT-101E (inc. built in RF Processor) plus many more additions (compact, solid state final, low power consumption).



Technical Data

Frequency Range
160m 1.8-2.0 MHz
80m 3.5-4.0 MHz
40m 7.0-7.5 MHz
20m 14.0-14.5 MHz
15m 21.0-21.5 MHz
10m 28.0-29.5 MHz
0 28.0-29.5 MHz
C 29.0-29.5 MHz
D 29.0-30.0 MHz
WWV 5.0-5.5 MHz
Aux. 27.0-27.5 MHz

Power
LSB USB, (A3J)
CW (A1)

Input Power
AT, A3J, 20 Watts DC

Carrier Supp.
Better than 40dB

Adj. Sideband Supp.
Better than 40dB

Spurious Red.
Better than -40dB

Audio Response
300-2700 Hz ± 5dB

Intermod. Distortion
Better than -31dB

Frequency Stability
300 Hz or better within the first 30 minutes and less than 100 Hz after warmup

Input Impedance
50 Ohm

Micro Impedance
500 Ohm

RF Sensitivity
0.3µV for 10dB S/N

Image Rejection
Better than 50dB

Selectivity
SSB -40dB at 2.4 KHz
-30dB at 4.0 KHz
CW -60dB at 0.6 KHz
-60dB at 1.2 KHz

Crossmod.
Better than 60dB with a 20dB signal at the ant. terminal 50 KHz away

Audio Output
3W at 10% THD

Output Impedance
4 Ohms

Supply Voltages
DC 13.5V Receive 0.4 Amp
Transmit 3 Amp (at 10W)

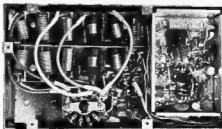
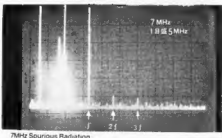
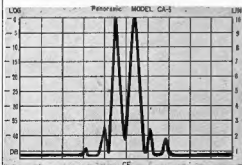
AC 230V Receive 40 VA
(With FP-301) Transmitted 110 VA (at 10W)

Dimensions
260mm wide, 125mm high, 290mm deep

Weight
7 kg

***Options**
Anticipated Prices
FT-301S Transceiver \$568
FP-301 Matching VFO \$130
FP-301 Heavy Duty AC Power Supply \$148
(May also be used to power 100W final)

Eleven crystal locked channels and 10 Watts PEP make the FT-301S particularly suitable for the new Novice and, at a later date, a 100 Watt outboard linear amplifier will be available from Yaesu, enabling the FT-301S to be upgraded for full licence operation. Additional plus features include automatic high VSWR protection of the final amplifier output transistors and selectable 100 KHz and 25 KHz calibration. Special care is taken to reduce unwanted harmonic radiation by the inclusion of separate double section Low Pass Filters for each band. Stocks of the FT-301S are expected toward the end of September.



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